Vol. 1007 Number 5

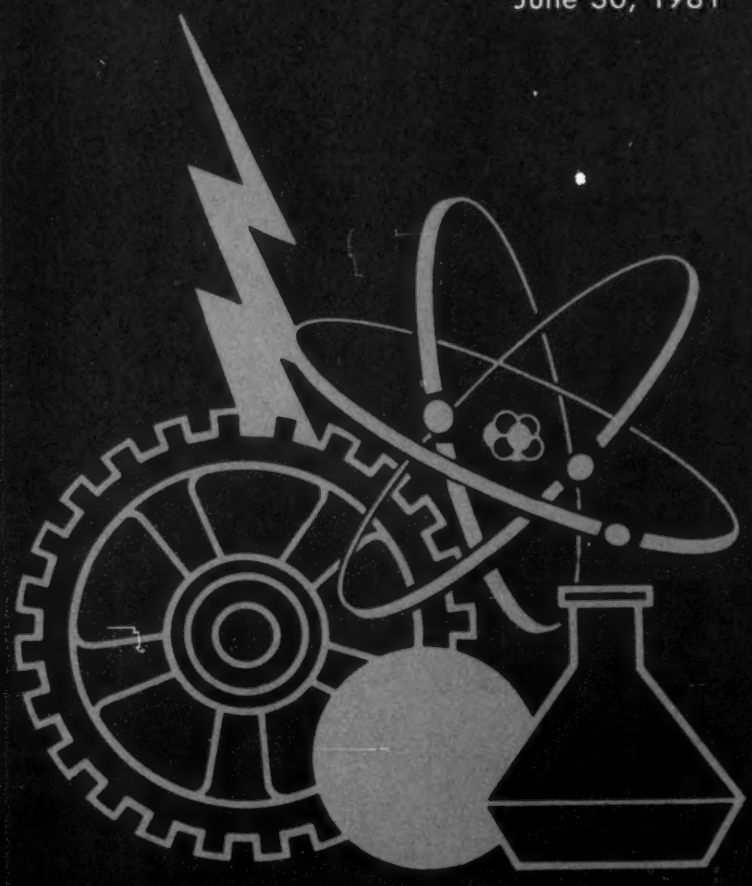
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

June 30, 1981



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

June 30, 1981 Volume 1007 Number 5

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT, consult Chapter 1800 of the Manual of Patent Examining Procedure and notices 90-95 in the consolidated listing of notices appearing in the Official Gazette of Jan. 6, 1981.

The PCT fees in effect after May 19, 1981 are as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Basic Fee (for the first 30 sheets of an international application)	215.00
Basic Supplemental Fee (for each sheet over 30)	4.00
International Designation Fee (for each State for which a national patent is sought, or group of States for which the same regional patent is sought)	50.00

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

Board of Appeals Decisions Rendered in the Month of May 1981

Affirmed	207
Affirmed in Part	18
Reversed	65
Total	290

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,291,947, Re. S.N. 256,435, Filed Apr. 22, 1981, Cl. 200/148R, INTERRUPTING STRUCTURES FOR COMPRESSED-GAS CIRCUIT INTERRUPTERS HAVING DOUBLE-BREAK HOLLOW ROTATIVE MOVING CONTACT-ARM ASSEMBLY, Roswell C. Van Sickle, Owner of Record: *Westinghouse Electric Corp., Pittsburgh, Pa.,* Attorney or Agent: C. L. McHale, et al., Ex. Gp.: 217

4,146,306, Re. S.N. 247,882, Filed Mar. 26, 1981, Cl. 350/211, OPTICAL LENS, David L. Wallach, Owner of Record: *Inventor,* Attorney or Agent: J. T. Hoffmann, et al., Ex. Gp.: 257

4,150,896, Re. S.N. 251,574, Filed Apr. 6, 1981, Cl. 355/75, COPYING APPARATUS COVER, William G. Wakeman, Owner of Record: *Pitney Bowes, Inc., Stamford, Conn.,* Attorney or Agent: Lawrence E. Sklar, et al., Ex. Gp.: 211

4,187,118, Re. S.N. 222,264, Filed Jan. 2, 1981, Cl. 106/189, CONCRETE COMPOSITION FOR MAKING CONCRETE MOLDINGS AND METHOD FOR MAKING SUCH CONCRETE MOLDINGS, Koji Nakagawa, et al., Owner of Record: *Denki Kagaku Kogyo, Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Paul J. Sutton, Ex. Gp.: 113

4,222,249, Re. S.N. 253,042, Filed Apr. 10, 1981, Cl. 66/120, WARP KNITTING MACHINE WITH COMPOUND NEEDLES, Karl Winter, Owner of Record: *Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Germany,* Attorney or Agent: Omri M. Behr, et al., Ex. Gp.: 353

PATENT NOTICES

Certificates of Correction for the Week of June 30, 1981

4,019,551	4,242,682	4,254,218	4,259,613
4,054,737	4,242,749	4,254,410	4,259,728
4,114,318	4,244,578	4,254,703	4,259,827
4,129,662	4,245,601	4,254,819	4,260,029
4,131,848	4,246,102	4,255,032	4,260,065
4,136,216	4,247,008	4,255,322	4,260,140
4,186,319	4,247,486	4,255,408	4,260,385
4,191,338	4,248,163	4,255,438	4,260,396
4,206,169	4,248,710	4,255,683	4,260,454
4,206,762	4,249,003	4,256,003	4,260,502
4,213,449	4,249,063	4,256,068	4,260,506
4,217,989	4,249,950	4,256,230	4,260,531
4,218,284	4,250,105	4,256,415	4,260,549
4,220,887	4,250,264	4,256,738	4,260,712
4,222,607	4,250,301	4,256,756	4,260,738
4,223,133	4,250,383	4,256,905	4,260,744
4,223,715	4,250,702	4,256,959	4,261,154
4,224,614	4,251,276	4,257,231	4,261,478
4,225,645	4,251,584	4,257,486	4,261,863
4,226,675	4,251,904	4,257,593	4,262,027
4,227,002	4,252,009	4,257,761	4,262,355
4,229,924	4,252,050	4,257,921	4,262,438
4,231,395	4,252,083	4,257,979	4,262,455
4,231,627	4,252,133	4,258,218	4,262,566
4,231,652	4,252,152	4,258,238	4,262,650
4,233,225	4,252,367	4,258,241	4,262,682
4,233,617	4,252,613	4,258,520	4,262,788
4,233,839	4,252,846	4,258,646	4,262,796
4,234,266	4,252,905	4,258,746	4,262,953
4,234,492	4,252,945	4,258,880	4,263,053
4,235,485	4,252,986	4,258,957	4,263,365
4,237,819	4,252,993	4,259,095	4,263,638
4,238,505	4,253,006	4,259,413	4,263,659
4,238,666	4,253,397	4,259,414	4,263,866
4,240,618	4,253,543	4,259,495	4,264,385
4,241,150	4,253,793	4,259,547	4,264,515
4,242,596	4,253,950	4,259,551	4,264,946

National Technical Information Service

U.S. GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and, possibly, foreign licensing.

Copies of patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of patent applications cited are available from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $5.00 each ($10.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to avoid premature disclosure. Claims and other technical data will usually be made available to serious prospective licensees upon execution of a non-disclosure agreeement.

Requests for information on the licensing of particular inventions shold be directed to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

DOUGLAS J. CAMPION.
Program Coordinator,
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

U.S. DEPARTMENT OF AGRICULTURE

Program Agreements and Patent Branch
Administrative Service Division Federal Building
Science & Education Administration
Hyattsville, Md. 20782

Patent application 6-212,655. Controlled Release of Bioactive Materials Using Alginate Gel Beads. Filed Dec. 3, 1980.

Patent application 6-223,509. Method of Purifying Fatty Acid Ester Products. Filed Jan. 8, 1981.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health
Chief, Patent Branch
Westwood Building
Bethesda, Md. 20205

Patent application 6-181,954. Monoclonal Antibodies Against Herpes Simplex Virus Types 1 and 2 Nucleocapsids and Kit. Filed Aug. 27, 1980.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents
18th and C Streets, N.W.
Washington, D.C. 20240

Patent application 6-211,556. Chromatography Developing Chamber. Filed Dec. 1, 1980.

U.S. DEPARTMENT OF THE NAVY

Director, Navy Patent Program/
Patent Counsel for the Navy
Office of Naval Research
Code 302
Arlington, Va. 22217

Patent application 6-089,659. Automatic Elevator Control System. Filed Oct. 30, 1979.

Patent application 6-153,474. Precision Laser Pulse Radiometer. Filed May 27, 1980.

Patent application 6-187,888. Replaceable Fuel Nozzle Nut Lockwasher. Filed Sep. 17, 1980.

Patent application 6-211,600. A Subseafloor Environmental Simulator. Filed Dec. 1, 1980.

Patent application 6-219,291. A System for Remotely Determining Velocity of Sound in Water. Filed Dec. 22, 1980.

Patent application 721,630. Laser Contour Mapping System. Filed Aug. 25, 1976.

Patent 4,208,979. Pontoon Spudwell System. Filed June 16, 1978. Patented June 24, 1980. Not available NTIS.

Patent 4,229,402. Fiber Optic Connection Method. Filed July 18, 1978. Patented Oct. 21, 1980. Not available NTIS.

Patent 4,231,107. Serriform Strip Crosstie Memory. Filed Feb. 14, 1978. Patented Oct. 28, 1980. Not available NTIS.

Patent 4,231,311. Towable Pod Assembly for Protectively Disabling Incoming Torpedoes. Filed Sep. 1, 1978. Patented Nov. 4, 1980. Not available NTIS.

Patent 4,232,417. Marine Mammal Retrieval Apparatus. Filed Jan. 24, 1979. Patented Nov. 11, 1980. Not available NTIS.

Patent 4,233,477. Flexible, Shapeable, Composite Acoustic Transducer. Filed Jan. 31, 1979. Patented Nov. 11, 1980. Not available NTIS.

Patent 4,235,693. Submersible Energy Storage Apparatus. Filed Nov. 9, 1979. Patented Nov. 25, 1980. Not available NTIS.

Patent 4,236,043. Frequency Compression and Expansion Using an Electrooptical Processor. Filed Apr. 13, 1979. Patented Nov. 25, 1980. Not available NTIS.

Patent 4,240,272. Arctic Canteen. Filed June 18, 1979. Patented Dec. 23, 1980. Not available NTIS

Errata

"All reference to Design Patent No. 259,196 to John Pardo of New York for HAND-HELD TELEPHONE appearing in the Official Gazette of May 12, 1981 should be deleted since no patent was granted."

"All reference to Patent No. 4,233,735 to William Sadayuki Tsuchiya of Ill. for FLEXIBLE LINE CUTTING APPARATUS appearing in the Official Gazette of Nov. 18, 1980 should be deleted since no patent was granted."

"All reference to Patent No. 4,263,882 to Etsuhiro Tezuka, Koichiro Kaji and Toru Ichinose all of Japan for INTERNAL COMBUSTION ENGINE appearing in the Offical Gazette of Apr. 28, 1981 should be deleted since no patent was granted."

"All reference to Patent No. 4,265,207 to Takanori Hayashida of Japan for INDUCTION SYSTEM OF FOUR STROKE INTERNAL COMBUSTION ENGINE appearing in the Official Gazette of May 5, 1981 should be deleted since no patent was granted."

"All reference to Patent No. 4,266,303 to Joon B. Park of South Carolina for METHOD OF ORTHOPEDIC IMPLANTATION AND IMPLANT PRODUCT appearing in the Official Gazette of May 12, 1981 should be deleted since no patent was granted."

"All reference to Patent No. 4,266,959 to Kimo M. Welch of California for CYROGENIC PUMP WITH RADIATION SHIELD appearing in the Official Gazette of May 12, 1981 should be deleted since no patent was granted."

"All reference to Patent No. 4,269,910 to Teresita O. Graham and John T. Goodman both of New York for ELECTROCHEMICAL CELLS HAVING A GELLED ANODE-ELECTROLYTE MIXTURE appearing in the Official Gazette of May 26, 1981 should be deleted since no patent was granted."

"All reference to Patent No. 4,270,699 to David A. Siekmeier, Glen L. Andersen, Columbus; Arthur L. Zimmerer, Deceased, Late of Lindsay, Nebr., By First National Bank and Trust Co., Columbus, Bernadette Zimmerer, Lindsay, Nebr. and William P. Zimmerer, San Luis Obispo, Calif. for LATERALLY MOBILE IRRIGATION SYSTEM appearing in the Official Gazette of June 2, 1981 should be deleted since no patent was granted."

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sacramento: California State Library	(916) 323-4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
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	University Park: The Pennsylvania State Libraries	(814) 865-4861
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Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF May 16, 1981

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	2-07-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	02-05-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	1-07-80
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-03-80
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	01-28-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	11-13-79
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	9-17-79
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—VACANT ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-14-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	12-07-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	03-28-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	3-26-79
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	01-09-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	11-06-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	9-13-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	10-22-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director ..... Building Structures; Racks; Cabinets, Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	06-22-79

Expiration of patents: The patents within the range of numbers indicated below expire during May 1981, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,131,397 to 3,134,980, inclusive

Plant Patents ..... Numbers 2,399 to 2,406, inclusive

REISSUES

JUNE 30, 1981

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,656

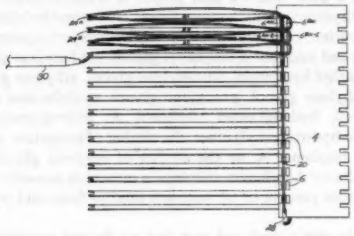
WEAVING SYSTEM, METHOD OF WEAVING AND APPARATUS

Edward Davitian, 420 E. 55th St., New York, N.Y. 10022

Original No. 4,109,355, dated Aug. 29, 1978, Ser. No. 765,796, Feb. 4, 1977. Application for reissue Dec. 8, 1978, Ser. No. 967,718

Int. Cl.³ D03D *29/00*

U.S. Cl. 28—151 **11 Claims**



11. Weaving apparatus for individually manipulable single fiber fabrication of woven fabrics comprising:

a weaving holding frame having

a plate like base portion having first and second spaced marginal edges,

means extending above the surface of said base portion for receiving a fiber,

a plurality of elongate rod members having one end thereof terminally mounted in said first marginal edge of said base portion and extending outwardly therefrom, each of said rod members having a fiber containing notch at the unmounted terminal end thereof, and

an elongate weaving wand having a lateral cross-section less than the space between adjacent rod members adapted to feed a fiber from one end and to selectively dispose a weft fiber around, over or under an elongate rod member when positioned such that the longitudinal axis of the weaving wand is substantially parallel to the longitudinal axis of the elongate rod member.

Re. 30,657

BALANCED BOTANICAL GROWTH CONTAINER

Stanley I. Mason, Jr., and James E. Richardson, both of Weston, Conn., assignors to Simco, Incorporated, Weston, Conn.

Original No. 3,961,446, dated Jun. 8, 1976, Ser. No. 578,425, May 19, 1975. Application for reissue May 31, 1977, Ser. No. 801,811

Int. Cl.³ A01G *9/00*

U.S. Cl. 47—79 **27 Claims**

19. A plant growth container eliminating plant over-watering and reducing root rot comprising:

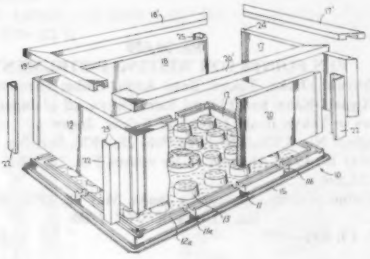
a water impermeable base having:

an inner channel substantially defining the periphery of the growth container, capable of receiving and supporting a soil containment means,

a series of root control means located on the base surface within the inner channel, said root control means extending upwardly from said base to a predetermined height defining an upper plane, and

an outer water/gas transmission channel substantially defining the periphery of the base having a plurality of channels in communication with the root control means,

the bottom of the inner channel and the upper plane of said root control means being generally higher than the top of the water/gas transmission channel, and



separate soil containment means fitting into the inner channel.

Re. 30,658

APPARATUS FOR TREATING WORK PIECES

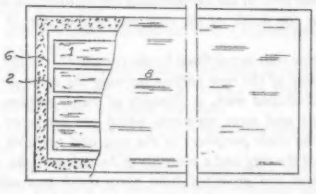
Karl E. Arvidsson, Dannemoragatan 10, 113 44 Stockholm, Sweden

Original No. 4,007,706, dated Feb. 15, 1977, Ser. No. 574,962, May 6, 1975. Application for reissue Nov. 1, 1978, Ser. No. 956,656

Claims priority, application Sweden, May 6, 1974, 7406006

Int. Cl.³ B27K *3/10*

U.S. Cl. 118—50 **11 Claims**



1. Apparatus for treating workpieces in an enclosed space, said apparatus comprising:

[a.] workpiece-supporting means having a workpiece-supporting surface;

[b. a rigid framework in proximity to and coextensive with edge portions of said workpiece-supporting surface, said framework having a side facing said workpiece-supporting surface;]

[c.] a collapsible material [secured to said framework] defining an enclosed space over the workpiece-supporting surface;

[d. a plurality of spaced posts secured to said framework; and]

[e. wall members secured to and supported by said spaced posts extending continuously about said framework, said wall members together with said collapsible material defining between them a liquid-tight chamber.]

flexible sealing means between the edge portions of the workpiece-supporting surface and the side of the collapsible material facing said edge portions; and

a container disposed beneath said workpiece-supporting surface, said container extending beyond the sides of said workpiece-

supporting surface, and a skirt member extending from the collapsible material into said container.

Re. 30,659

PEN POINTS FOR WRITING INSTRUMENTS

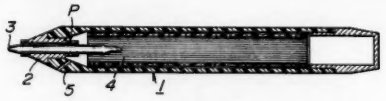
Nobuyuki Otake, Tokyo; Kozo Ando, Chiba; Hironobu Hori, Higashi-Kana, and Ykinori Sato, Tokyo, all of Japan, assignors to Tokyo Boshi Kabushiki Kaisha, Japan

Original No. 4,076,428, dated Feb. 28, 1978, Ser. No. 684,677, May 10, 1976. Application for reissue Feb. 22, 1980, Ser. No. 123,508

Claims priority, application Japan, May 15, 1975, 50-56693

Int. Cl.[3] **B43K** *7/00, 1/06*

U.S. Cl. 401—209 **31 Claims**



17. [The pen point as claimed in claim 1,] *In pen point for writing instruments which is a rod-shaped wick formed by uniting molten synthetic resin monofilaments, wherein radially curved narrow slots extend toward the center of the wick from an outer periphery portion (ring portion) in the cross-section and the radial narrow slots are defined by a plurality of segments projected from the ring portion, an improvement comprises that the rod-shaped wick is provided in the cross-section with curved narrow slots extending not only in the substantially radial direction toward the center from the inside of the ring portion but also in the other directions,*

said narrow slots are defined by the components of the pen point consisting of the ring portion forming the outer periphery of the rod-shaped wick, a plurality of trunk portions or trunk portions and stem segments which are projected inwardly from the inner periphery of the ring and partition the inner space of the ring and a plurality of branch portions, which are branched and projected from every trunk and additionally partition the remainder of the above described space,

said components of the trunks, the trunks and stems and branches are adjacently arranged so that the end portions and the sides of these components are not connected with one another and that these components constitute 2–6 fold axis symmetry wherein the center axis of the ring is the rotary axis,

every component of the ring, the trunks, the stems and the branches has at least one size and shape,

every trunk provided with branches form at least one of standing tree-formed projections in the inside of the ring,

the trunks or the stems of the number corresponding to the fold number of the above described fold axis symmetry are opposed at the center portion,

every side of the narrow slots is formed by connection of circular arcs of a large number of monofilaments, which constitute the elementary components

the narrow slots extend from one end to the other end of the pen point, and

wherein the trunks or stems of the number corresponding to the fold number of the fold axis symmetry are united at the top portions thereof through the circumstance of a monofilament arranged at the center axis of the ring.

Re. 30,660

WATER SOLUBLE INSULATING VARNISH

Deno Laganis, 2331 Algonquin Rd., Schenectady, N.Y. 12309

Original No. 4,179,420, dated Dec. 18, 1979, Ser. No. 709,107, Jul. 27, 1976. Continuation-in-part of Ser. No. 624,569, Oct. 21, 1975, abandoned. Application for reissue Feb. 11, 1980, Ser. No. 120,373

Int. Cl.[3] **C09D** *3/52, 3/64, 3/66, 5/02*

U.S. Cl. 260—21 **26 Claims**

1. A process for forming a water-dispersible polyester capable of being solubilized to become water-soluble comprising reacting (1) with (2a) to form (I), wherein

(1) is isophthalic acid, terephthalic acid, benzophenone dicarboxylic acid or mixtures thereof and wherein

(2a) includes a polyol having at least three hydroxyl groups and a diol, wherein said polyol is trimethylol-propane, tris(hydroxymethyl)aminoethane, trimethylolethane, glycerine, pentaerythritol or tris(hydroxyethyl)isocyanurate and said diol is neopentyl glycol, 1,4-butylene glycol, dimethyl hydantoin, dipropylene glycol, ethylene glycol, diethylene glycol, propylene glycol, cyclohexane dimethanol, hydrogenated bisphenol A, hydroquinone di-(beta-hydroxyethyl) ether, the diether of propylene glycol and bisphenol A, or the diether of ethylene glycol and bisphenol A; wherein said triol is present in amounts up to 35 mole percent of all reactants used to form said polyester;

wherein said polyol and said diol are heated together and then said component (1) is added thereto;

and adding (II) which is (a) trimellitic anhydride; (b) an aliphatic dibasic acid which is adipic acid, succinic acid, azelaic acid, sebacic acid, dimerized fatty acids, maleic acid, fumaric acid or an anhydride of said acids or (c) a cycloaliphatic acid which is tetrahydrophthalic acid, hexahydrophthalic acid, 3,6-endomethylene, delta[4]-tetrahydrophthalic acid or an anhydride of said acid, which component (II) is 15 to 65 mole percent based on the total moles of (1) and (II), and wherein (1) comprises 35 to 85 mole percent of the total amount of (1) and (II);

wherein the mixture of (1) and (2a) is heated until a portion of the mixture containing 100 percent solids is characterized by an acid number of [at least] about 10 *up to 20.*

Re. 30,661

ELECTRIC CURRENT PRODUCING GALVANIC CELL

Morris Eisenberg, Mountain View, Calif., assignor to Electrochimica Corporation, Mountain View, Calif.

Original No. 3,891,458, dated Jun. 24, 1975, Ser. No. 416,073, Nov. 15, 1973. Application for reissue Mar. 23, 1977, Ser. No. 780,649

Int. Cl.[3] **H01M** *6/14*

U.S. Cl. 429—194 **2 Claims**

14. A galvanic cell comprising:

A. a porous solid cathode;

B. an anode that includes lithium; and

C. an electrolyte for electrolytic conduction between said anode and cathode consisting essentially of thionyl chloride in which is dissolved

a. a first solute consisting essentially of lithium chloroaluminate in a concentration of between 0.5 and 3.0 moles per liter, and

b. a second solute consisting of a mixture of sulfolane and sulfur dioxide in a concentration of between 0.5 and 6.0 moles per liter.

Re. 30,662

COMMUNICATIONS HEADSET WITH REVERSIBLE MOUNTING MEANS

James P. Foley, Astoria, N.Y., assignor to Roanwell Corporation, New York, N.Y.

Original No. 3,971,901, dated Jul. 27, 1976, Ser. No. 555,529, Mar. 5, 1975. Application for reissue Jul. 21, 1978, Ser. No. 926,716

Int. Cl.[2] H04M *1/05*

U.S. Cl. 179—156 A 22 Claims

16. A reversible headset comprising:

a. headband means for supporting the headset on a wearer's head, said headband means having an aperture extending horizontally therethrough, parallel to a head engaging surface thereof;

b. beam means having one end slidable into either end of said aperture, so that the beam means may be mounted with its other end extending forwardly from said headband means on either side of the head;

c. means including a projection on the outside of the beam means for releasably retaining the beam means in the aperture;

[c.] *d.* housing means [supported on] *rotatably connected to* the other end of the beam means *and depending from the outer side thereof, so that when the beam means is moved from one side of the head to the other, the housing may be rotated thereon to retain its depending configuration and to maintain the projection on said outer side of the beam means;*

[d.] *e.* a reversible microphone having sound receiving openings on two opposite faces;

[e.] *f.* articulated joint means [supported] on said housing means *and spaced from the beam means;*

[f.] *g.* a conduit having one end [connected to] *supporting* the microphone and the other end connected to the joint *means*, said conduit being curved so that the microphone is disposed laterally of the housing means;

[g.] *h.* conductor means connected at one end to the microphone and extending through the conduit and the joint *means* into the housing means; and

[h.] *i.* means, including the conduit and the joint *means*, supporting the microphone for adjustment of its operating position with respect to the wearer's mouth on either the left or right-hand side of the head[.], *the openings in one face of the microphone being closest to the wearer's mouth when the microphone is on the left side of the head, and the openings in the other face of the microphone being closest to the wearer's mouth when the microphone is on the right side of the head.*

Re. 30,663

ELECTRICALLY CONDUCTIVE PNEUMATIC SPRING WITH DOOR ACTUATED SWITCH MEANS

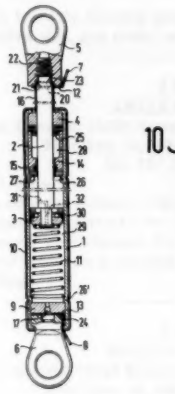
Klaus Schnitzius, Rheinbrohl, Fed. Rep. of Germany, assignor to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

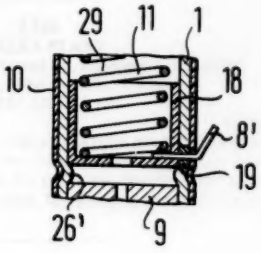
Original No. 3,919,509, dated Nov. 11, 1975, Ser. No. 482,645, Jun. 24, 1974. Application for reissue Nov. 3, 1977, Ser. No. 848,346

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1973, 2332791

Int. Cl.[3] H01H *3/16;* B60L *1/02;* F16F *9/18;* H01R *41/00*

U.S. Cl. 200—52 R 41 Claims





1. A pneumatic spring comprising:

(a) a cylinder member having an axis and formed with a cavity;

(b) a piston assembly axially movable relative to said cylinder member between two end [postions] *positions*, said assembly including

(1) a piston axially separating two compartments in said cavity, and

(2) a piston rod member fixedly fastened to said piston and axially projecting from said cavity in sealing engagement with said cylinder member;

(c) a body of gas in said cavity and impeding axial movement of said piston assembly;

(d) fastening means on respective, oppositely spaced, axially terminal portions of said cylinder member and of said piston rod member outside said cavity for fastening said members to respective objects and including insulating means for electrically insulating said members from the respective fastened objects;

(e) respective electrically conductive terminals mounted on said cylinder member and on said piston rod member outside said cavity; and

(f) electrically conductive means in said cavity conductively connecting said terminals in one of said end positions of said piston assembly.

25. A pneumatic spring comprising:

(a) a cylinder member having an axis and formed with a cavity;

(b) a piston assembly axially movable relative to said cylinder member between two positions, said assembly including a rod member axially projecting from said cavity in engagement with said cylinder member;

(c) a body of gas at a pressure higher than atmospheric in said cavity for impeding axial movement of said piston assembly;

(d) fastening means on said cylinder member and on said rod member for fastening said members to respective objects;

(e) two electrically conductive terminals respectively secured to said cylinder member and to said rod member outside said cavity;

(f) electrically conductive means located at least in part in said cavity for conductively connecting said terminals; and

(g) insulating means for insulating said terminals and said conductive means from said objects.

27. A spring as set forth in claim 25, wherein said conductive means include a resilient contact element in said cavity conductively connected to the terminal secured to said cylinder member, electrically insulating mounting means securing said contact element and the connected terminal to said cylinder member, and an electrically conductive face on said piston assembly engaging said contact element in said one position of the piston assembly while being spaced from said contact element in said other position of said piston assembly.

28. A spring as set forth in claim 25, wherein said cylinder member and said piston assembly have respective electrically conductive portions conductively connected to said terminals, said electrically conductive means in said cavity include a contact member secured to one of said electrically conductive portions and engaging the other electrically conductive portion during at least a part of the movement of said piston assembly between said two positions.

PLANT PATENTS

GRANTED JUNE 30, 1981

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,747

ROSE PLANT

Charles P. Elliot, 2208 Monterey Ave., Santa Clara, Calif. 95051

Filed Apr. 30, 1980, Ser. No. 145,330

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct cultivar of rose, substantially as described and pictured herein, characterized by its large regular pink blooms, vigorous growth, continuous blooming and persistence.

4,748

DWARF PEACH W-110

Fedor Wassiliew, deceased, late of Orange, Calif.; by Nicolaus Wassiliew, heir, Costa Mesa, Calif.; by Alexander Wassiliew, heir; by Marsha W. Hartman, heir, both of Orange, Calif., and by Valentina Wassiliew, heir, Costa Mesa, Calif., assignors to Jackson & Perkins Co., Medford, Oreg.

Filed May 1, 1980, Ser. No. 145,675

Int. Cl.[3] A01H *5/03*

U.S. Cl. Plt.—42 **1 Claim**

1. A new and distinct variety of peach tree of the genetically dwarf type, substantially as herein shown and described, characterized particulary as to novelty by its unique combination of a vigorous dwarf plant, single or partially double, light pink flowers, late July ripening date, nearly spherical red flushed, pale yellow skin, and sweet, white, red-streaked flesh.

4,749

AZALEA PLANT

Howard Kerrigan, 24249 Second St., Hayward, Calif. 94541

Filed Feb. 11, 1980, Ser. No. 120,721

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—57 **1 Claim**

1. A new and distinct variety of Azalea plant as described and illustrated, known by the cultivar name "Super Red", and particularly characterized by the extra double, very large, clear red bloom on a vigorous, fast-growing plant with excellent foliage.

4,750

GAZANIA PLANT

Paul C. Enright, 11615 Riverside Dr., Lakeside, Calif. 92040

Filed May 16, 1980, Ser. No. 150,603

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Gazania plant substantially as herein described, characterized particularly as to novelty by its unique flower and varying leaf form.

PATENTS

GRANTED JUN. 30, 1981

ERRATA

For CLASS	See PATENT NO.
738–062.32	4,275,588
411–078	4,275,637
493–316	4,275,644
369–074	4,275,888
428–480	4,276,183

PATENTS

GRANTED JUNE 30, 1981

GENERAL AND MECHANICAL

4,275,467

SLIDING CLASP FASTENERS AND GARMENTS, ARTICLES AND SHEETING HAVING SUCH FASTENERS

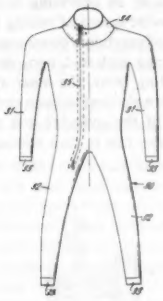
Gandolph Doelter, London, England, assignor to The New Zipper Company Limited, Slough, England

Filed Feb. 26, 1979, Ser. No. 14,846

Claims priority, application United Kingdom, Mar. 1, 1978, 8166/78; Jul. 4, 1978, 28786/78

Int. Cl.[3] **A41D** *13/00;* **A44B** *19/32*

U.S. Cl. 2—82 **16 Claims**



1. A fluid tight open ended or separable continuous fastener comprised of two rows of fastener elements secured to first and second strips of impervious flexible material, respectively, each having inside and outside faces, a slider which is movable along the rows from one end of the fastener towards the other end, said slider being operative on movement in the closing direction to bring the elements of the two rows into interlocking fluid tight engagement against fluid pressure acting transversely of the fastener and to close at least said one end of the fastener and on movement in the opening direction to separate the elements of the two rows, and an additional sealing means provided on the inside face of each of said strips adjacent the end to be closed, each said additional sealing means having an edge running longitudinally of said fastener so that when said one end of the fastener is closed said additional sealing means lie in edge to edge contact and said edges are held under sufficient compression by said slider across the entire contact area such that a fluid tight seal is obtained therebetween which resists fluid pressure acting longitudinally of the fastener at said one end thereof.

12. A garment incorporating at least one fastener as claimed in claim **1**.

13. A garment as claimed in claim **12**, wherein the garment is a one-piece protective suit having the fastener extending from the collar of the suit towards and then part way down one leg of the suit along a line which for the most part is parallel to but to one side of the centerline of the suit, the end of the fastener at the collar of the suit being an open end.

4,275,468

WINTER JERSEY WITH HAND WARMER

Homer G. Outlaw, 855 N. Carrollton, Apt. 8, Baton Rouge, La. 70806

Filed May 14, 1979, Ser. No. 38,727

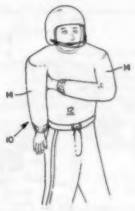
Int. Cl.[3] **A41D** *10/00, 27/20*

U.S. Cl. 2—115 **10 Claims**

1. A cold weather jersey to be worn by participants in activities requiring the use of ungloved hands comprising:

an upper body encasing portion made of warm material and suitable for wearing by a human while taking part in such activities;

said body encasing portion being provided with sleeve portions attached thereto for encasing the arms of a wearer; and



means associated with the armpit area of the jersey for providing warmth and protection for the hands whenever desired by the wearer, wherein said means includes a pocket portion attached to at least one of the sleeves near the inner armpit portion thereof.

4,275,469

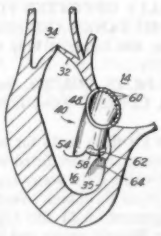
PROSTHETIC HEART VALVE

Shlomo Gabbay, Bronx, N.Y., assignor to Shelhigh Inc., New York, N.Y.

Filed Dec. 13, 1979, Ser. No. 103,214

Int. Cl.[3] **A61F** *1/22*

U.S. Cl. 3—1.5 **18 Claims**

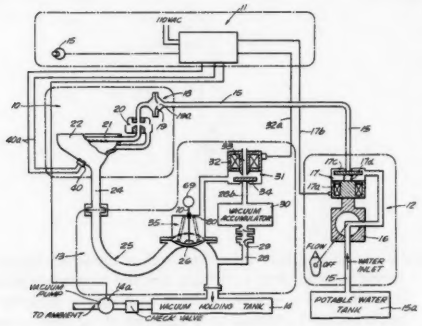


1. A prosthetic heart valve comprising a tubular membrane having an inlet end and an outlet end, the inlet end being adapted to be attached about the annulus of the heart, and a substantially seimcircular supporting structure attached to a semicircular section of the outlet end of said tubular membrane and adapted to be attached to the wall of the heart, whereby the remaining section of the tubular membrane at the outlet end remains free and is movable toward and away from the supported portion thereof to close or open the outlet end of the tubular membrane.

4,275,470
VACUUM-FLUSH TOILET ARRANGEMENT FOR AIRCRAFT

Everett H. Badger, and Michael J. Rogerson, both of La Habra, Calif., assignors to Rogerson Aircraft Controls, Los Angeles, Calif.

Continuation of Ser. No. 58,586, Jul. 18, 1979. This application Aug. 20, 1979, Ser. No. 68,131
Int. Cl.³ B64D *11/02*
U.S. Cl. 4—316 **12 Claims**



1. A non-circulating vacuum-operated flush waste disposal system for aircraft having a toilet comprising:

a. a bowl for receiving waste matter,

b. means for supplying rinse water to bowl,

c. a drain for said bowl connected to a waste holding tank having a vacuum therein,

d. a flush valve in said drain having a flexible valve element movable between closed and open positions, whereby said flush valve in open position applies vacuum to said toilet bowl,

e. vacuum actuated means for opening said flush valve, said vacuum actuated means applying vacuum to the outer surface of said flexible valve element, and

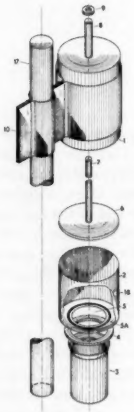
f. power means connected to said vacuum actuated means whereby vacuum may be applied thereto in order to open said flush valve, said flush valve automatically returning to closed position when power to said power means is discontinued.

4,275,471
HYDRAULICALLY OPERATED FLUSH VALVE FOR TOILET FLUSH TANKS AND SIMILAR DEVICES

Howard W. Becker, 804 Imperial Way SW., Calgary, Alberta, Canada (T2S 1N7)

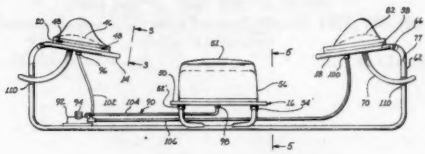
Filed Jul. 17, 1978, Ser. No. 925,643
Int. Cl.³ E03D *1/34, 1/14, 3/12*
U.S. Cl. 4—387 **3 Claims**

1. A flush valve for flush tanks for toilets and like devices comprising a stationary cylinder fitted with a moveable piston and positioned below the filled water level of the flush tank by attachment to the usual flush tank overflow tube by means of a clamping arrangement, with the longitudinal axis of the cylinder and piston directly above and vertically aligned with the vertical axis of a flush tube located in the bottom of the flush tank; the lower end of the stationary cylinder being open and accommodating the moveable piston, while the upper end is closed and provided with a tube which is suitably smaller in diameter than the diameter of the cylinder and which opens into the cylinder and extends above the normal filled level of the water in the flush tank and communicates with the air space above the water; the piston being moveable vertically within the cylinder and having its upper end open while its lower end is closed except for a centrally located circular opening which is suitably smaller than the diameter of the interior opening of the flush tube; the bottom of the otherwise closed end of the piston being fitted with an annular resilient sealing element around and concentric with the circular opening and so sized as to fit onto the circular upper edge of the flush tube, thus becoming the sealing portion of the moveable element of the said flush valve, while the upper portion of the flush tube acts as the stationary seat of the flush valve; the upper side of the lower annular portion of the piston being fitted with an annular inner valve seat so that a moveable element comprising an inner valve can seat thereon and thus close the bottom end of the piston; the inner moveable valve element being connected to a rod (or tube) which passes through the smaller diameter tube in the upper end of the stationary cylinder and thus into the air space above the filled level of the flush tank and which can be raised by an operating lever of the flush tank; an operating lever inner arm being adapted so as to provide means of raising the inner valve rod, and being incapable of exerting a downward force thereon; the whole mechanism being such that, upon depressing an exterior handle of the operating lever, the inner arm thereof is raised causing the inner valve element to open and allowing the liquid within the interior of the cylinder and piston to discharge through the flush tube; this in turn eliminating the hydraulic



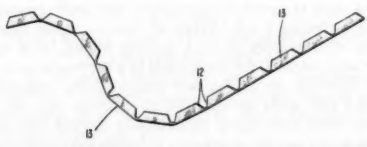
force within the piston and thus allowing the hydraulic force on the annular area of the outside of the bottom of the piston not covered by the flush tube to raise the piston and the sealing element and thus open the flush valve; whereby when the piston rises, the moveable element of the inner valve rests upon its annular seat in the upper side of the piston end; whereby when the water level in the flush tank has dropped to a level near the bottom of the raised piston, there is no longer sufficient upward force to maintain the piston in the raised position, and it moves downward so that the sealing element on the bottom fits onto the flush tube valve seat, and the flush valve is closed; the flush tank thus being allowed to fill with the water from a float-actuated water fill valve, and allowing the water to flow through a small port in the side of the piston which is opened when the piston is in the down position and closed when the piston is in the up position; this in turn developing a hydraulic force on the inside bottom of the piston (with the closed inner valve) which is greater than the hydraulic force on the annular area of the outside bottom of the piston which is not covered by the flush tube, maintaining the piston in the down (valve closed) position until the next actuation of the operating lever occurs.

4,275,472
RECLINER
Edwin E. Erck, P.O. Box 1065, Camp Verde, Ariz. 86322
Filed Oct. 26, 1979, Ser. No. 88,606
Int. Cl.[3] A61G 7/10
U.S. Cl. 5—60 8 Claims



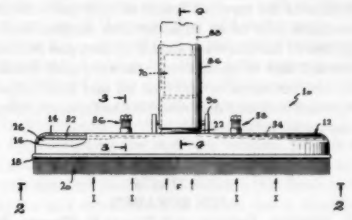
1. A recliner for supporting only discrete body sections of a user, said recliner comprising in combination:
(a) a framework;
(b) a head section mounted upon said framework for supporting the neck of the user, said head section including a cushion;
(c) a mid-section mounted upon said framework for supporting the hips of the user, said mid-section being located distinct and laterally apart from said head section to preclude support for a user's back intermediate his supported neck and hips, said mid-section including a cushion;
(d) a foot section mounted upon said framework for supporting the lower legs of the user, said foot section being located distinct and laterally apart from said mid-section to preclude support for a user's legs intermediate his supported hips and lower legs, said foot section including a cushion;
(e) first means for varying the angular orientation of said head section with respect to said framework; and
(f) second means for varying the angular orientation of said foot section with respect to said framework.

4,275,473
MATTRESS
Jean B. Poirier, P.O. Box 781, Sallisaw, Okla. 74955
Filed Jul. 25, 1979, Ser. No. 60,504
Int. Cl.[3] A47C 27/08; A47B 83/04
U.S. Cl. 9—13 3 Claims



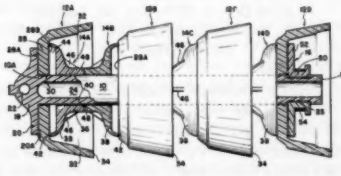
1. A mattress having linear flexibility and comparative lateral rigidity, said mattress comprising a plurality of lightweight, relatively rigid, buoyant blocks of substantially equal dimensions formed of a cellular plastic material, said blocks having bevelled longitudinal edges and said blocks being held in side-by-side spaced relation by an outer skin of a plastic film having a thickness of approximately 0.006 to 0.015 inches, and wherein said outer skin is formed by stitching or sealing together between said blocks a sheet of said film positioned above said blocks and a sheet of said film positioned below said blocks and wherein said blocks are spaced approximately 0.25 to approximately 1.25 inches apart whereby the mattress may be rolled with the bevelled edges internally located and wherein said mattress has a handle attached to one or both of the ends thereof.

4,275,474
VACUUM HEAD FOR SWIMMING POOL CLEANING SYSTEM
Randle C. Woodard, 20751 Prairie St., Chatsworth, Calif. 91311
Filed Apr. 30, 1979, Ser. No. 34,298
Int. Cl.[3] E04H 3/20
U.S. Cl. 15—1.7 10 Claims



1. A vacuum head for a swimming pool cleaning system, said vacuum head having a head intake area, said vacuum head comprising:
a housing located about said head intake area, said housing having an upper wall;
outlet means formed in said upper wall;
first and second vacuum hose connector means associated with said outlet means for attachment of differently-sized vacuum hoses to said vacuum head, said second hose connector means including a hose adapter snap-fitted into said first hose connector means and having a hose connecting diameter smaller than the last-mentioned connector means;
vacuum control means formed in said upper wall for preventing an excessively high water suction force in said head intake area resulting from too great a vacuum build-up, said vacuum control means being in the form of at least one water by-pass valve for regulating the suction within said head intake area, said valve including a closure member associated with a water vent in said upper wall, and an axially adjustably positionable stem member for maintaining said closure member in a closed position relative to said vent, thereby selectively controlling the extent of water flow into said vacuum head; and
means for attachment of handle means to said vacuum head.

4,275,475
PIPELINE PIG
Robert E. Schwartz, 4227 E. 52 Pl., Tulsa, Okla. 74145; Laurence M. Neff, 10031 E. 52nd St., Tulsa, Okla. 74145, and Gary N. Utter, 5603 S. 77 E. Ave., Tulsa, Okla. 74145
Filed Nov. 2, 1979, Ser. No. 90,628
Int. Cl.[3] B08B 9/04
U.S. Cl. 15—104.06 R 7 Claims



1. A pipeline pig comprising:
a shaft of flexible plastic having a forward end and a rearward end and having an enlarged head portion at the forward end;
a plurality of dish members of flexible plastic each havng an axial opening therethrough, each dish member having a

radial inner portion having a forward and rearward face and an integral rearwardly extending outer portion;

a plurality of flexible plastic spacers, each having an axial opening therethrough, each spacer having an integral cup portion at one end of an outside diameter less than the diameter of said radial inner portion of sid dish members, two spacers being received on said shaft in back-to-back relationship between adjacent dish members, the cup portion of the forward spacer of each pair contacting the rearward face of an adjacent dish member and the cup portion of the rearward spacer of each pair contacting the forward face of an adjacent rearward dish member;

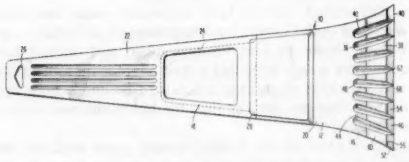
and a retainer member received on said shaft adjacent said rearward end, said dish members and spacers being held in contiguous relationship.

4,275,476

ICE SCRAPER

Evan L. Hopkins, Emporia, and Robert R. Thomas, Hartford, both of Kans., assignors to Hopkins Manufacturing Corporation, Emporia, Kans.

Filed Sep. 19, 1979, Ser. No. 76,822
Int. Cl.³ B60S *1/04*; A47L *1/06*
U.S. Cl. 15—236 R **10 Claims**



1. A hand-held scraper for removing ice from a smooth surface, said scraper comprising a one piece body defining:

a handle section extending from said handle section, and a blade region comprising:

a plurality of resilient, independently flexible, scraping fingers, each said finger extending from said intermediate section and terminating in a front scraping edge, and

a plurality of thin web members, each said web member being thin enough not to interfere with the individual flexibility of said scraping fingers, and extending from a finger to an adjacent finger, and having a thin front edge aligned with said scraping edges of said web members, and the scraping edges of said fingers thereby forming a continuous scraper blade edge.

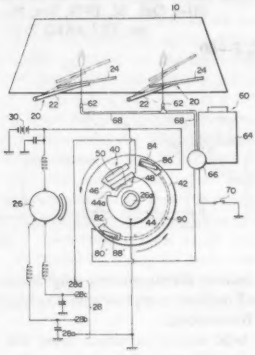
4,275,477

VEHICLE WINDOW GLASS WASHING SYSTEM

Yoshiaki Kato, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 4, 1979, Ser. No. 100,127
Claims priority, application Japan, Dec. 14, 1978, 53-172506
Int. Cl.³ B60S *1/48*
U.S. Cl. 15—250.02 **3 Claims**

1. A system for washing a vehicle window glass, comprising: at least one swingable wiper means provided in sliding contact with said window glass, at least one injector means for injecting liquid detergent onto a position of said window glass when actuated, a rotary disc rotatable in synchronism with swinging movement of said wiper means, a pair of contact plates disposed on said rotary disc symmetrically with respect to the center of said rotary disc, a pair of contacts fixed to face said rotary disc, said contact plates electrically connected to each other, and said fixed contacts disposed symmetrically with respect to the center of said rotary disc, whereby said rotary disc can bring one of said contact plates into contact with one of said fixed contacts while at the same time the other contact plate into contact with the other fixed contact to allow actuation of said injector means except when said wiper means is around said position.

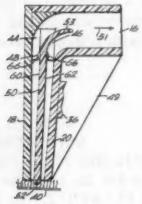


4,275,478

EXTRACTOR HEAD FOR CLEANING SOFT SURFACES SUCH AS CARPET OR UPHOLSTRY

Raymond W. Kohlenberger, 211 N. 61 Ave., Apt. #4, Hollywood, Fla. 33024

Filed Oct. 1, 1979, Ser. No. 80,301
Int. Cl.³ A47L *7/00, 11/34*
U.S. Cl. 15—401 **8 Claims**



1. An extractor head for removing dirt and cleaning soft surfaces, such as carpet or upholstery, said head comprising a housing including a top having an interior throat diverging laterally downwardly from a suction mouth, said suction mouth being adapted for connection to a suction hose to apply suction through the throat, said housing being composed of front and rear walls spaced from one another and said front and rear walls converging downwardly toward one another defining a slit-type throat opening to sweep over a soft surface, said housing also including side walls closing the sides of the throat between the front and the rear walls, and a rigid pivotal flap-type squeegee in the throat, said squeegee including an upper end adjacent the top of the housing and a portion extending toward the suction mouth and a lower surface extending beyond the throat and beyond the front and rear walls completely across the throat between the side walls, said squeegee being of a thickness less than the distance between said front and rear walls and pivot means pivotally mounting the squeegee for swinging action, alternatively, against the rear wall or front wall, depending upon the direction of movement of the extractor head across a soft surface and wherein the squeegee plate includes holes adjacent the lower end thereof to release suction forces upon changing of the direction of the movement; said squeegee including an upper deflector zone arcuately curved and extending toward said suction mouth for

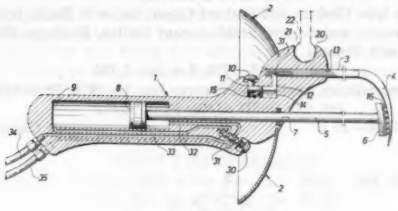
directing removed fluid and debris from a soft surface and directing it toward the suction hose.

4,275,479

DEVICE FOR HANDLING OF MEAT AND CUTTING-UP THEREOF

Kaarlo J. Korhonen, Säterivägen 18, S 161 70 Bromma, Sweden

Filed Jun. 22, 1979, Ser. No. 51,236
Claims priority, application Sweden, Jun. 22, 1978, 7807190
Int. Cl.³ A22B 5/00
U.S. Cl. 17—1 R **10 Claims**



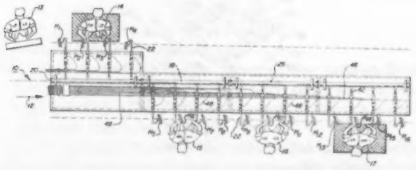
1. A device for handling of meat at cutting-up thereof, especially cutting loose meat from a carcass part, comprising:
a handle;
said handle having means for selectively gripping a piece of meat, said means comprising:
a claw member, said claw member having:
a shaft, said shaft being mounted on said handle;
a die, said die being included on an end of said shaft; and
a die surface, said die surface being included on said die;
a punch member, said punch member being accommodated by said handle such that said punch member is selectively linearly movable toward and away from said die;
means for selectively driving said punch member toward and away from said die; and
a punch surface included on said punch member, said punch surface cooperating with said die surface when said punch member is moved toward said die such that said piece of meat is gripped between said punch surface and said die surface;
wherein said die surface and said punch surface are each arranged substantially in planes normal to the direction of movement of said punch member.

4,275,480

ELECTRONIC INJECTION METERING AND MONITORING SYSTEM

William W. Norton, Lincolnshire; Jack L. Stansbeary, Elk Grove Village; Johann Clemens, Palatine, and Roscoe T. Earl, Lincolnshire, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 21, 1979, Ser. No. 13,513
Int. Cl.³ A22C 9/00
U.S. Cl. 17—25 **5 Claims**



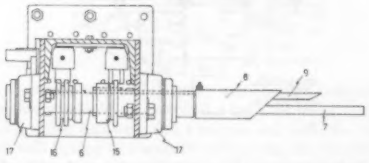
1. A system for injecting slaughtered carcasses with tenderizing solution, in which the carcasses to be injected are weighed and are conveyed to a plurality of sequential injection stations, the improvement comprising, in combination:
at least one injection header located at each injection station;
means for providing injection solution to each header;
storage means for storing weight data for each injection station;
means for providing weight data to said storage means, in sequence corresponding to the injection station sequence, whereby different carcasses may be at each of the plurality of stations at the same time and each carcass will be tracked as it is conveyed to each successive station and the weight data in a storage location for the respective station will correspond to the carcass at the respective station;
means for providing energization time periods that are directly proportional to the carcass weight; and
means for energizing the injection headers for calculated energization time periods whereby each carcass is injected by each injection header with solution that flows automatically for said calculated time period that is directly proportional to the carcass weight.

4,275,481

CARCASS SCALPING

Colin A. Roberts, 15 Dunvegan Pl., Hamilton; John S. Nelson, Railway Rd., Whakatu, Hawkes Bay; David E. Annan, 5a Cuffs Rd., Christchurch 6, and Angus A. J. Robertson, No. 1 R.D., Rangiora, all of New Zealand

Filed Oct. 5, 1979, Ser. No. 82,322
Claims priority, application New Zealand, Oct. 11, 1978, 188635
Int. Cl.³ A22B 5/16
U.S. Cl. 17—50 **10 Claims**

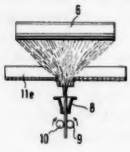


1. Apparatus for scalping the carcass of an animal such as a sheep, comprising
composite means providing a composite roller capable of being machine rotated in at least one rotational direction, said composite roller having a first portion and a second portion movable with respect to said first portion between one position where an appropriate region of head pelt of an animal to be scalped can be positioned relative to one of said portions, and another position whereby the two portions can coact to clamp said appropriate region of head pelt when so positioned relative to one of said portions,
means providing a rotational support for said composite roller,
means actuable to cause movement of said portions between said positions, and
means actuable to rotate said composite roller in at least one rotational direction when in the clamping position.

4,275,482
ARRANGEMENT FOR FORMING A SLIVER FROM A CARD WEB

Ferdinard Leifeld, Kempen, Fed. Rep. of Germany, assignor to Trutzschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed Sep. 7, 1979, Ser. No. 73,525
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1978, 2839414
Int. Cl.³ D01G *15/46*
U.S. Cl. 19—150 **7 Claims**

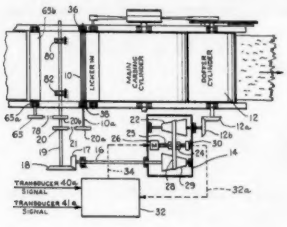


1. In a carding arrangement, a combination comprising means for carding fibers to produce a fibrous sliver; a pair of nip rollers positioned to receive the fibrous sliver so that the same passes through the nip between said rollers; means, including a sliver-compacting funnel, arranged beneath said nip rollers for withdrawing the fibrous sliver from the nip thereof and converting it with a coherent ribbon; and a sliver guide baffle surrounding the path of movement of said sliver intermediate said nip rollers and said withdrawing means.

4,275,483
CONTROL APPARATUS FOR A CARDING MACHINE

James H. Roberson, Rte. 6, 203 Ashwood Ave., Greenville, S.C. 29607

Filed Dec. 5, 1979, Ser. No. 100,640
Int. Cl.³ D01H *5/32, 5/38*
U.S. Cl. 19—240 **22 Claims**

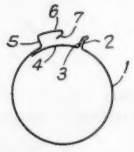


1. Control apparatus for controlling the production of a web or sliver of uniform weight on a carding machine having a main driving motion, said apparatus comprising:
output roll means driven by said main driving motion;
a first nipping surface fixed against movement with respect to a frame of said carding engine;
a driven input roll providing a second nipping surface movably mounted for displacement along a line of displacement relative to said first nipping surface in response to the amount of fibrous material nipped therebetween;
means for biasing said input roll toward said first nipping surface;
transducer means including a sensing member for sensing movement generally along said line of displacement to produce a control signal which is indicative of the amount of displacement of said input roll;
speed variator means having an input driven in basic speed synchronization with said output roll and an output for driving said input roll;
a program controller responsive to said control signal from said transducer means for producing a speed control signal;
speed control means responsive to said speed control signal to alter the output speed of said speed variator means; and
drive means connecting said output of said speed variator means and said driven input roll;
whereby variations in the amount of fibrous material nipped between said nipping surfaces is sensed and corrected in the same mechanical plane.

4,275,484
OPEN TYPE CLAMP

Francis Irio, Chabris, and Richard Chene, Selles St Denis, both of France, assignors to Etablissement Caillau, Boulogne-Billancourt, France

Filed Jan. 15, 1979, Ser. No. 3,754
Claims priority, application France, Jan. 18, 1978, 78 01401
Int. Cl.³ B65D *63/06;* F16L *33/02*
U.S. Cl. 24—20 R **6 Claims**

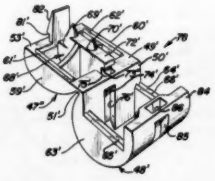


1. An "open" type clamp, comprising a wound metal strip having two ends and provided, close to the two ends of the strip, with a set of first and second radial ears, respectively, said first ear being bent over with respect to the strip such that said strip extends therefrom with a first extension directed along the periphery of the clamp and extending at least over the distance separating the two ears, from said first ear towards the second ear, and said second ear being provided with an extension which is substantially always parallel to the periphery of the clamp and situated at a distance therefrom nearly equal to the height of said first ear and including at its end a portion bent inwardly of the clamp, said last-mentioned portion being spaced from the periphery of the clamp a distance less than the height of said first ear so that said last-mentioned portion is adapted to ride over and engage said first ear by means of a spring-like action to tightly fix said clamp about an object, without any permanent deformation of said first and second ears.

4,275,485
SEALING DEVICES

Charles L. Hutchison, 7855 S. Normandy, Burbank, Ill. 60459

Filed Dec. 10, 1979, Ser. No. 101,859
Int. Cl.³ B65D *77/10*
U.S. Cl. 24—30.5 R **18 Claims**



1. A sealing device for engaging gathered together material at an end of a bag or casing enclosure, comprising: first and

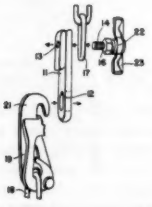
second closure members each having first and second opposite side portions and first and second end portions, hinge means connecting said first side portions of said first and said closure members for relative pivotal movement about a hinge axis between an open condition in which gathered-together material is received therebetween and a closed condition in which the gathered-together material is clamped therebetween, and interengageable locking means for holding said members in said closed condition, said first member having a central projecting portion between said first and second end portions thereof and said second member having an opening between said first and second end portions thereof for receiving said central projecting portion and the gathered-together material engaged by said central projecting portion, said hinge means being operable to guide said locking means into registering engagement and being also operative to guide said central projecting portion of said first member into registering relationship with respect to said opening in said second member.

4,275,486

SNOW CHAIN RELEASE

Chester L. Bridges, 1530 Arbor Ave., Los Altos, Calif. 94022

Filed Jul. 12, 1979, Ser. No. 56,917
Int. Cl.³ B60C *11/00*; F16L *33/12*
U.S. Cl. 24—299 **3 Claims**



1. The combination with one of the circular chains of a snow chain for tires of motor vehicles,
- a flat connecting plate having an aperture at one end and a threaded hole at the other end,
- a hook on the link at one end of the circular chain fitting into said aperture,
- and a bolt fitting into said threaded hole,
- a bearing portion on said bolt spaced from said plate so as to bear upon a link on the other end of said circular chain and on said plate thereby to clamp the link between said bearing portion and said plate when the bolt is threaded in said threaded hole.

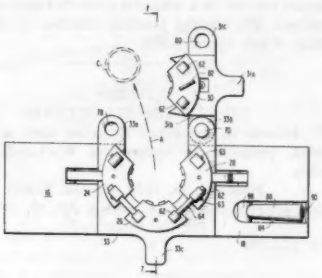
4,275,487

WELL CASING SPIDER

Charles E. Gray, deceased, late of Jena, La., and Emma D. W. Gray, executrix, c/o B. G. Tool Co. Inc., P.O. Box 966, Jena, La. 71342

Filed Jan. 4, 1979, Ser. No. 952
Int. Cl.³ A44B *21/00*; E21B *19/07*
U.S. Cl. 24—263 DC **5 Claims**

1. A well casing spider comprising:
- a unitary elongated base member;
- a bowl for said base member;
- said bowl segmented in two sections, one section fixedly secured within said base member, the other section pivotedly attached to said one section and forming a door for said bowl and base member;
- arcuate segments vertically movable within said one section;
- an arcuate segment carried on and moveable relative to said pivotable door;
- means attached to diametrically opposed arcuate segments within said one section for effecting vertical movement thereof; and
- means linking said diametrically opposed arcuate segments



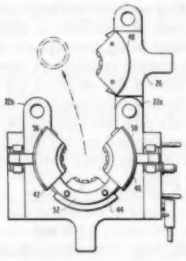
to an adjacent arcuate segment within said one section and to the arcuate segment on said door whereby upon operation of said vertically moving means all of said arcuate segments move vertically in unison.

4,275,488

COMBINED WELL CASING SPIDER AND ELEVATOR

Charles E. Gray, deceased, late of Jena, La., and by Emma D. W. Gray, executrix, Jena, La. 71342

Continuation-in-part of Ser. No. 952, Jan. 4, 1979. This application Apr. 25, 1979, Ser. No. 33,081
Int. Cl.³ E21B *19/07*; A44B *21/00*
U.S. Cl. 24—263 DC **13 Claims**



1. A combined well casing spider and elevator comprising:
- a main body including a base wall, a top wall, a pair of lateral walls, a first end wall, and a second end wall, the second end wall having two sections comprising recessed flanges spaced from one another, said main body further including a bowl inner wall tapered to reduced diameter from the top wall to the bottom wall;
- a gate member pivotally secured to one of the sections of the second end wall and releasably secured to the other of said sections to connect said sections when in a secured position, and pivoting laterally when released to permit the lateral entry of a well casing within the area defined by said bowl inner wall, the gate member having a gate inner wall co-operating with the bowl inner wall to comprise a bowl section, said gate inner wall carrying a vertically movable and removable slip member;
- a circumferential array of casing gripping slips arranged in opposing pairs for vertical and radial mounting in surface contact with said bowl inner wall, said gripping slips forming a circular hole within the center thereof to receive a well casing and vertically movable along the bowl inner wall to effect radial enlargement and contraction of the circular hole formed thereby by upward and down-

ward movement respectively to release and grip the casing; and

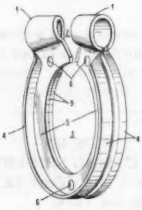
means connected to at least one pair of said casing gripping slips for effecting vertical movement of the entire array of casing gripping slips relative to said bowl inner wall, said means carried by a rotatable cross rod each end of which extends into bearing journals attached to the insides of each of said lateral walls.

4,275,489

PIPE CLAMP STRUCTURES

Jan O. Johansson, and Gösta Karlsson, both of Anderstorp, Sweden, assignors to Anderstorps Werkstads Aktiebolag, Sweden

Filed Jul. 16, 1979, Ser. No. 57,820
Claims priority, application Sweden, Jul. 17, 1978, 7807874
Int. Cl.[3] B62D *1/18*
U.S. Cl. 24—279 **1 Claim**



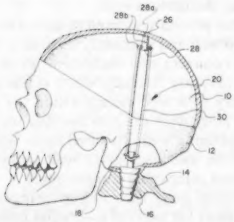
1. A tube clamp comprising: a plate having a first and second flat portions, each having a hole, said holes being equal in diameter, wherein said holes are connected by a slot in said plate having a first and second flange portion surrounding and remote from each of said hole in said first and second flat portions, said plate being transversely bent between said first and second flat portion to create a connector passage, wherein said first and second flat portions are in contact with each other and said holes are substantially coaxial and said first and second flanges are directed away from each other; a means to connect said bent first and second flat portion selected from the group of welds or rivets; and a connector means going through said connector passage.

4,275,490

METHOD AND APPARATUS FOR SECURING CALVARIUM SKULL SECTION TO BASAL SKULL SECTION

Charles F. Bivins, Rte. 1, Box 278, Burlington, N.C. 27215

Continuation-in-part of Ser. No. 963,815, Nov. 27, 1978, abandoned. This application Mar. 28, 1979, Ser. No. 25,290
Int. Cl.[3] A01N *1/00*
U.S. Cl. 27—21 **13 Claims**



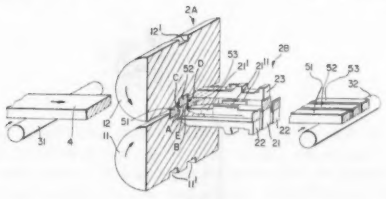
1. A calvarium assembly for securing a calvarium skull section to the basal skull section after the calvarium skull section has been cut and removed from the skull as a part of an autopsy, said calvarium connecting assembly comprising: first anchoring means for forming a first anchor point about an area that generally lies about the lower area of said basal skull section; second anchoring means for forming a second anchor point within said calvarium skull section in general alignment with said first anchoring means; coupler attaching means associated with both said first and second anchoring means for allowing said first and second anchoring means to be interconnected; and flexible coupling means operatively interconnected between said coupler attaching means associated with said first and second anchoring means for securing said calvarium skull section to said basal skull section with a biasing type holding action as said flexible coupling means tends to exert a pulling action between said first and second anchoring means so as to firmly and securely hold said calvarium skull section securely in place about said basal skull section.

4,275,491

MULTI-COMPLEX SHEAR DEVICE FOR SPLITTING HOT METALLIC BARS INTO SEVERAL SMALLER BARS

Roberto Marinucci, Via Lucia Silla, 59 Napoli, Italy

Continuation-in-part of Ser. No. 873,385, Feb. 8. 1977, abandoned. This application Nov. 30, 1979, Ser. No. 98,827
Int. Cl.[3] B21B *15/00, 1/00*; B26D *11/00*
U.S. Cl. 29—33 R **8 Claims**



1. A shear for two stage continuous shearing of a hot metallic first bar into smaller cross-sectional sized second bars, having a predetermined thickness, width and height, as the first bar comes out of a continuous casting mill in a steel plant or out of a blooming or rolling mill, said shear comprising in combination:

a first mechanical complex operable to cut the first bar about ⅔ through the thickness thereof and to deform the uncut thickness of the hot metallic first bar continuously into a predetermined sized and number of displaced sections; and

a second mechanical complex operable to sever the displaced sections into separated smaller bars;

said first mechanical complex comprising:

first and second shearing rolls, means for separating said first and said second rolls for disposing them apart about one-third the thickness of said first bar and means for rotatably driving said first and said second rolls in counter directions to roll therebetween hot metallic bars, said first and said second rolls each having grooves formed therein, and non-grooved portions, the grooves on said first roll being displaced with respect to the grooves on said second roll so that non-grooved portions of each said roll are aligned with grooved portions of the other said rolls, the total number of grooves being equal to the total number of second bars to be formed;

each said groove having a width equal to the predetermined width of the second bars and a depth of about one-third the thickness of the second bars, said rolls coacting to deform the hot first bar being rolled between said rolls, said rolls permanently deforming the rolled hot bar into displaced sections corresponding in size to the second bars;

said second mechanical complex comprising lower tools and upper tools anchored with respect to each other and to said first mechanical complex, said upper and said lower

tools having forward portions aligned with respect to displaced surfaces of the deformed sections of said first bar as it passes through said first mechanical complex, to guide the displaced surfaces over said upper and lower tools;

said upper and said lower tools operating conjointly to support and to guide the displaced sections apart from each other; and,

means on said upper and said lower tools for severing the deformed first bar into separate, smaller sectioned bars.

4,275,492

METHOD OF DISASSEMBLY OF JOINTED STRUCTURE

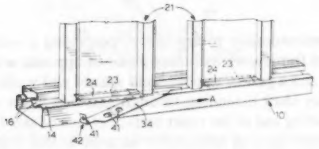
Roy H. Mills, Toronto, Canada, assignor to Westeel-Rosco Limited-Westeel-Rosco Limitee, Toronto, Canada

Division of Ser. No. 863,863, Dec. 23, 1977, Pat. No. 4,202,532. This application Dec. 13, 1979, Ser. No. 103,122

Claims priority, application Canada, Nov. 22, 1977, 291516

Int. Cl.[3] B23P *19/04*; B25B *27/00*

U.S. Cl. 29—426.5 **2 Claims**



1. A method of disassembling a jointed structure comprising a first member provided with a recess, and a second member presenting a resiliently deformable lip which is disposed, with the lip resiliently deformed, within the recess in the first member with a space provided between the lip and a bottom wall of the recess, and with a free edge of the lip in biting engagement with a side wall of the recess, the recess in the first member extending beyond the lip of the second member, wherein the method comprises the steps of disposing an inclined projection at one end of a shank portion of a joint disassembly tool within the recess in the first member adjacent to the lip of the second member, sliding the projection in the longitudinal direction of the recess along the recess to introduce a tip of the projection which is adjacent the bottom wall of the recess into the space between the lip and the bottom wall of the recess, continuing said sliding of the projection solely in the longitudinal direction of the recess to pry the lip by a camming action of the inclined projection of the tool thereby resiliently to deform the lip, and removing the lip from the recess in the first member.

4,275,493

METHOD FOR MAKING A FABRIC REACTOR TUBE

Edwin Matovich, and James B. Copelan, both c/o Mr. George F. Thagard, Jr., 60 Linda Isle, Newport Beach, Calif. 92660

Division of Ser. No. 606,246, Aug. 20, 1975, Pat. No. 4,208,373, which is a continuation-in-part of Ser. No. 271,560, Jul. 13, 1972, Pat. No. 3,933,434. This application Oct. 30, 1978, Ser. No. 955,532

Int. Cl.[3] B23P *19/04*

U.S. Cl. 29—454 **14 Claims**

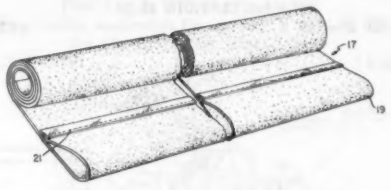
1. A method of making a porous reactor tube for a high temperature fluid-wall reactor in which substantially all of the heat is supplied by radiation coupling, which method comprises:

(A) folding over one edge of a sheet of a fabric of a fibrous refractory material upon itself to form a space on the inside of the fold, the space being defined by a first surface of the sheet;

(B) binding the edge in the folded position;

(C) placing a smooth-surfaced, contractible mandrel in a contracted state adjacent the first surface and extending along the length of the edge;

(D) expanding the mandrel, a first portion of the sheet being disposed around and in contact with the contractible



mandrel and the remaining portion of the sheet being attached to and extending from the first portion;

(E) winding a length of the remaining portion of the sheet around the mandrel to form a multi-layer tube; and

(F) binding together the layers of the tube.

4,275,494

METHOD FOR MANUFACTURING LIQUID CRYSTAL DISPLAY ELEMENTS

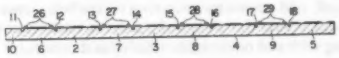
Masaharu Kohyama, and Tadashi Ishibashi, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 6, 1979, Ser. No. 46,026

Claims priority, application Japan, Jun. 30, 1978, 53-78671; Nov. 1, 1978, 53-133710

Int. Cl.[3] G02F *1/13*

U.S. Cl. 29—592 R **8 Claims**



1. A method for manufacturing liquid crystal display elements, comprising the steps of:

defining, with at least one boundary line, plural regions on each of two glass substrates;

forming a transparent electrode having a desired pattern on each of said plural regions;

forming a closed loop of layer of bonding agent in each of selected ones of said regions on at least one of said glass substrates, said layers having a predetermined width and thickness and extending along said boundary line and the edge of said glass substrate;

combining said two glass substrates together in such a manner that said regions of one substrate are opposite to the corresponding regions of the other substrate and that said two substrates are kept at a predetermined distance apart from each other;

forming a glass substrate assembly by bonding said two substrates together through a heat treatment of said bonding agent;

forming linear scratches in that surface of each of said substrates on which said transparent electrodes are not formed, said linear scratches corresponding in position to said boundary lines;

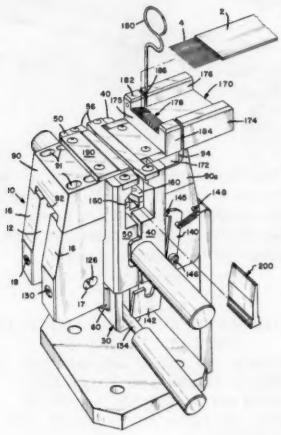
splitting said glass substrates along said linear scratches; and filling the spaces enclosed by said glass substrates and said bonding agent layers, with liquid crystal;

wherein said method further comprising, after the step of forming the electrodes, the step of forming grooves in that surface of each of said glass substrates on which said transparent electrodes are formed, along said boundary lines, each of said grooves having a predetermined width and depth and having a substantially U-shaped cross section and the bottom of the U-shape of said groove being rounded with a predetermined radius of curvature.

4,275,495
CONNECTOR TERMINATING TOOL

Andrew G. Boutcher, Jr., and Walter C. Shatto, Jr., both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 2, 1979, Ser. No. 53,673
Int. Cl.³ H01R *43/04*
U.S. Cl. 29—749 **6 Claims**



1. An apparatus for inserting conductors in a two sided connector comprising:

a housing having a connector receiving recess at one end thereof, said connector receiving recess being open on the top and at least one side, tool receiving cavities communicating with and on opposite sides of said connector receiving recess, rocker arm receiving cavities communicating with said tool receiving cavities, rocker shaft bores through said housing perpendicular to and communicating with said rocker arm cavities, first and second elongate passages aligned with and below said connector receiving recess and a hollow aligned with said rocker arm receiving cavities and intersecting said second elongate passage,

conductor wiping means disposed on either side of said connector receiving recess and movably mounted on a first shaft extending through said first elongate passage for movement of said wiping means in a generally parallel relationship to said connector receiving cavity,

conductor insertion tools slidably received in said tool receiving cavities, said tools having a conductor insertion means at one end thereof and a connecting means at the other end thereof,

rocker arms located in said rocker arm cavities and pivotably mounted on rocker shafts located in said rocker shaft bores, said rocker arms having a union means at one end thereof and dimensioned at the other end thereof to cooperate with said conductor insertion tool connecting means,

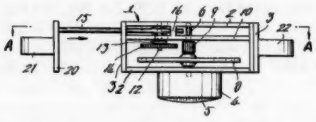
bar links dimensioned at one end to be received in said hollow and pivotably mounted on a common second shaft located in said second elongate passage, each of said bar links dimensioned at the other end thereof for pivotal union with said union means of a respective rocker arm,

whereby said connector is located in said connector receiving cavity, conductors are presented to said connector, said first shaft is moved from a first position to a second position within said first elongate cavity to wipe said conductors along said connector, said second shaft is then moved from a first position to a second position within said second elongate cavity to slide said connector insertion tools into said connector receiving cavity and insert said conductors in said connector.

4,275,496
SEMIAUTOMATIC ROTARY RAZOR

Bonpei Gotoh, 1-25-3, Hon Komagome, Bunkyo-ku, Tokyo, Japan

Filed Jun. 14, 1979, Ser. No. 48,364
Claims priority, application Japan, Jun. 27, 1978, 53-77773
Int. Cl.³ B26B *19/32*
U.S. Cl. 30—43.6 **7 Claims**



1. A semiautomatic rotary razor comprising a rectangular box-shaped framework including a pair of opposite and spaced side walls and a pair of opposite and spaced end walls, a transverse rotary shaft extending through said side walls with one end protruding out of the outer surface of one of said (the) side walls, an annular cap detachably secured at one end to said outer surface of said one of said walls and having a convexed reticulate outer blade secured to and extending across the other end of said cap, an inner blade assembly detachably secured to said rotary shaft closely adjacent to the concaved inner surface of said reticulate outer blade, a fly wheel and a first driven gear mounted on said rotary shaft inwardly of said inner blade assembly, a longitudinal partition wall extending between said end walls in parallel to said side walls, a stub shaft loosely mounted in said partition wall and the other of said side walls in a position offset from said rotary shaft, a transmission gear mounted on said stub shaft for engagement with said first driven gear, a second driven gear mounted on said stub shaft inwardly of said transmission gear, a spring-loaded slidable guide bar received in one of said end walls, a spring-loaded slidable rack bar received in said one end wall and having rack teeth thereon in engagement with said second driven gear on the stub shaft, an operation plate attached to the outer ends of said guide and rack bars, and a pair of finger pieces attached to the outer surface of said operation plate and the outer surface of the other end wall, respectively.

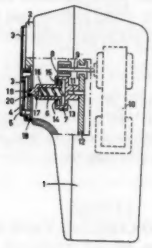
4,275,497
SHAVING APPARATUS

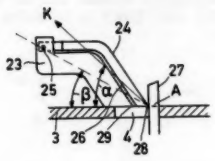
Manfred Engelhardt; Jan Reinink; Jochem J. De Vries; Ferdinand M. Trees; Eduard W. Tietjens, and Gerrit J. Groothuis, all of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 4, 1979, Ser. No. 72,256
Claims priority, application Netherlands, Sep. 21, 1978, 7809603
Int. Cl.³ B26B *19/14*
U.S. Cl. 30—43.6 **5 Claims**

1. A shaving apparatus having a shear plate provided with hair entry apertures and a cutting unit associated with and drivable relative to the shear plate; said cutting unit comprising a cutting member, cutters extending from said cutting member toward the shear plate, lead cutters respectively associated with and movable relative to the cutters in directions respec-

tively away from and toward the shear plate, and means to always maintain each lead cutter spaced from its associated





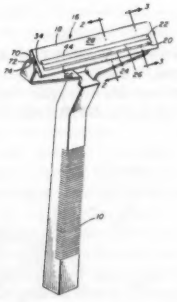
cutter throughout their respective lengths regardless of their relative position.

4,275,498

SAFETY RAZOR BLADE CARTRIDGE

John T. Ciaffone, Bridgeport, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 31, 1979, Ser. No. 108,744
Int. Cl.³ B26B *21/06, 21/22, 21/52*
U.S. Cl. 30—47 **7 Claims**



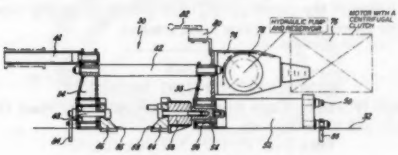
1. A razor blade cartridge comprising:
a one-piece elongate member including
a front elongate shaving surface,
a back surface, and
a portion defining a longitudinally extending slot in said member comprising an opening in said front surface communicating with an opening in said back surface,
said portion including a longitudinal wall defining a side of said slot, that is inclined relative to said front surface, and
a blade secured to said wall having a longitudinal cutting edge extending past said member front surface,
said blade having a thickness less than the width of said slot.

4,275,499

APPARATUS FOR REMOVING THE SURPLUS WELDING MATERIAL

Patrick Bommart, Rueil Malmaison, France, assignor to C. Delachaux, France

Filed Aug. 8, 1979, Ser. No. 64,544
Claims priority, application France, Aug. 9, 1978, 78 23448
Int. Cl.³ B23D *1/08;* **B26D** *3/08*
U.S. Cl. 30—180 **7 Claims**



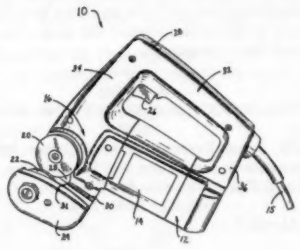
1. Apparatus for removing of the weld surplus formed after the aluminothermic welding of two rail butt ends, the apparatus comprising a frame having two horizontal and parallel guide bars, a first cutting tool secured to the frame and a second cutting tool movable relative to the guide bars towards the first cutting tool to remove the weld surplus, each tool having a cutting edge with a profile shaped to cut exclusively the weld surplus left on the rail head, and the second tool being movable in a direction selected from a direction horizontal and parallel to the longitudinal axis of the rail and a direction perpendicular to the longitudinal axis of the rail by a hydraulic jack attached to the frame and with its ram fixed to the second tool above its cutting edge, and a hydraulic unit integral with said apparatus, said jack being operated by said hydraulic unit.

4,275,500

ROTARY SHEAR

Howard D. Speer, Jr., Fayetteville, N.C., and Mark A. Proett, Missouri City, Tex., assignors to The Black & Decker Manufacturing Company, Towson, Md.

Filed May 29, 1979, Ser. No. 43,386
Int. Cl.³ B26B *15/00*
U.S. Cl. 30—40 **13 Claims**



1. An improved heavy-duty hand-held portable rotary shear adapted for cutting a wide variety of materials found in the home and on building construction sites, comprising a housing including a motor compartment, a gear box forwardly of the motor compartment and separated therefrom by a transverse wall, a motor in the motor compartment having a shaft journalled in a bearing in the transverse wall, a driving cutter wheel rotatably journalled in the gear box and having a lower portion protruding below the gear box, right-angle gearing means in the gear box connecting the motor shaft to the driving cutter wheel and providing an in-line cutting action, an overload release clutch in the gearing means, the housing further including a depending portion below the gear box, a driven cutter wheel rotatably journalled in the depending portion of the housing and cooperating with the driving cutter

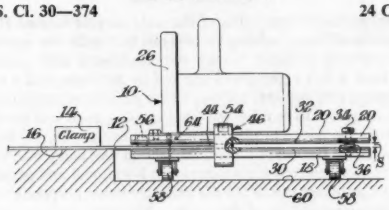
wheel for severing material fed therebetween, the severed material passing below the motor housing, and a handle spaced above and supporting said housing at the rearward end adjacent said motor compartment and at the forward end adjacent said gear box, said handle defining a recess forming a hand grip for the tool and including switch means for controlling said motor, whereby the portable shear has good balance for readily cutting a variety of materials, with the overload release clutch protecting the shear against unusually heavy materials that may be rapidly fed into the shear, and whereby the shearing action of the cooperating cutter wheels is readily viewed by the operator to facilitate close control.

4,275,501

LAMINATE CUTTING ASSEMBLY

Darrell W. Haire, Eagle River, Ak., assignor to Michael Herr, N.J. and Keith Johnson, Ak.

Filed Dec. 17, 1979, Ser. No. 104,015
Int. Cl.³ B27B 9/04
U.S. Cl. 30—374 **24 Claims**



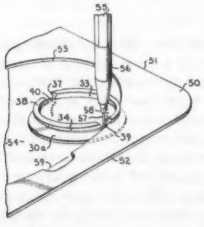
1. Laminate cutting assembly for cutting laminate sheets and the like comprising an upper plate, a lower plate disposed below said upper plate and spaced therefrom whereby the sheet to be cut may be inserted therebetween, an elongated slot in said upper plate and an aligned elongated slot in said lower plate, a cutter extending through said slots for cutting the sheet upon relative movement of the sheet with respect to said cutter, a guide bar assembly having a guide surface located in the space between said upper plate and said lower plate and disposed parallel to said elongated slots whereby the sheet may be disposed in said space and against said guide surface so that the cutter may cut through the sheet at a fixed distance from said guide surface, and said guide bar assembly including means for moving said guide surface toward and away from said slots to control said fixed distance.

4,275,502

DRAFTING DEVICE FOR PRODUCING CONCENTRIC LINES

Raymond L. Jones, Raytown, Jackson County, Mo. 64133

Continuation-in-part of Ser. No. 971,934, Dec. 21, 1978, abandoned. This application Jul. 23, 1979, Ser. No. 59,789
Int. Cl.³ B43L 11/06
U.S. Cl. 33—27 L **13 Claims**



1. A drafting device for use with a template for drawing concentric lines with respect to the template pattern, comprising:

a flat circular disc having upper and lower sides thereto,

a base fixed to the lower side of said disc substantially central thereof and operative to elevate the disc above a flat supporting surface when resting thereon,

a circular wall of lesser outer diameter than the disc outer diameter fixed to the upper side of said disc circumferentially inboard of the peripheral edge thereof and concentric thereto, and

at least one opening formed through the disc inboard of the wall for receiving a marking means therethrough,

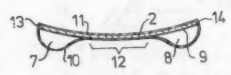
said circular wall being relieved at one portion thereof and a slot provided through said disc in said wall relieved portion for receiving a marking means therethrough.

4,275,503

UNCOILING AND COILING TAPE MEASURE

Lars A. Bergkvist, Gottne, 890 42, Mellansel, Sweden

Filed Jan. 23, 1979, Ser. No. 5,815
Claims priority, application Sweden, Jan. 30, 1978, 7801120
Int. Cl.³ G01B 3/02; E04H 12/18; B65H 75/16
U.S. Cl. 33—137 R **8 Claims**



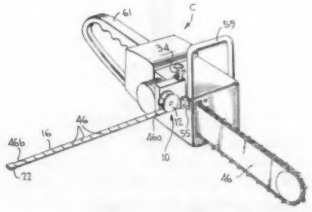
6. An uncoiling and coiling tape measure and a housing within which said coiled tape is stored, said tape measure at least in uncoiled state, having a slightly curved cross-sectional section with a convex lower surface, and a concave upper surface comprising: said tape on its convex lower surface and opposite to said concave upper surface being provided with at least one channel; a device carried by said housing and including means connected to said channel for supplying a fluid pressure medium to said channel to effect a substantial increase in the self-supporting capacity of the uncoiled tape measure; said at least one channel being a tubular member made from a ductile material, said member surrounding said tape and attached to the upper concave surface of said tape along substantially the entire length of said tape.

4,275,504

CUTTING SAW MEASURING ATTACHMENT

Stephen G. Chontos, West Dover, Vt. 05356

Filed Apr. 28, 1980, Ser. No. 144,037
Int. Cl.³ G01B 3/10, 3/08
U.S. Cl. 33—138 **14 Claims**



1. A measuring attachment for cutting saws, comprising a housing having an outlet, a flexible tape coiled onto a drum in said housing and extendible through said outlet for making length measurements, said drum being mounted on a central axle for rotation therewith, means for unwinding said tape upon rotation of said drum in a first direction, said means comprising an assembly of rack and pinion gears wherein said pinion gears are gear coupled with said axle for rotating said drum in said first direction, said rack gear being disposed for manual movement in one direction for rotating said pinion

gears, whereby said tape may be unwound a predetermined extent through said outlet upon movement of said rack gear.

4,275,505

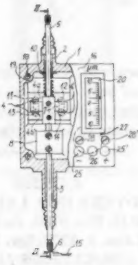
APPARATUS FOR CHECKING DIMENSIONAL TOLERANCES

Jean R. Delmas, Vanves, France, assignor to Microlec S.A., Fribourg, Switzerland

Continuation of Ser. No. 937,688, Aug. 28, 1978, abandoned, which is a continuation of Ser. No. 810,674, Jun. 27, 1977, abandoned. This application Jan. 21, 1980, Ser. No. 113,906

Int. Cl.³ G01B 7/02

U.S. Cl. 33—172 E **1 Claim**



1. Apparatus for detecting whether a measured dimension deviates from a nominal value by a predetermined increment comprising

a feeler assembly formed of a box having two coaxial tubular portions, one above and one below said box, and a control rod slideably mounted in the tubular portions of said box;

said control rod having a contact at one of its ends;

four photoelectric receivers mounted on one side of the box

a fixed diaphragm comprising two rectangular windows, the first of said windows being placed in front of a first pair of said receivers and the second of said windows being placed in front of a second pair of said receivers;

a movable mask fixed to said rod, said mask having a rectangular shape, moving in front of said windows so as to leave a gap between the edges of said mask;

spring means biasing the contact at the end of said control rod in contact with the component under inspection;

illuminating means for said photoelectric receivers for illumination through the gaps between the edges of the windows and the edges of the mask;

the movement of said rod through said feeler assembly varying the masked areas of the windows whereby the two diagonally oriented pairs of photoelectric receivers on opposite corners of the photoelectric receiver array each receive a differential illumination through said windows depending upon the position of said control rod and mask along the dimension of the component being tested for feeding the differential output of said illumination of two trigger circuits; and

an electronic circuit having two trigger circuits, one being a first trigger circuit receiving the differential output signal of one pair of diagonally oriented photoelectric receivers and delivering a first detection signal when the input signal exceeds a predetermined positive value and the other being a second trigger circuit receiving a differential output signal of the other pair of diagonally oriented photoelectric receivers and delivering a second detection signal when the input signal, due to the differential illumination, exceeds a predetermined negative value; and a gate connected to said first and second trigger circuits and delivering a third detection signal when said two trigger circuits are simultaneously inoperative.

4,275,506

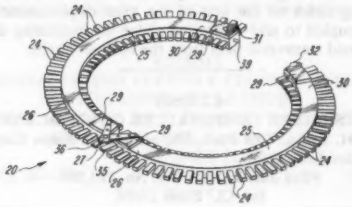
APPARATUS AND METHOD FOR PATTERNING GEOMETRIC OBJECTS

Francis Knoll, 2070 Rosemary, Denver, Colo. 80207

Filed Nov. 29, 1979, Ser. No. 98,671

Int. Cl.³ G01B 5/20

U.S. Cl. 33—175 **3 Claims**



1. A pattern making device adapted to contour an object having a geometric cross section in a single plane, comprising in combination:

a pair of opposed arms adapted to move between an open position and a closed position, said arms encompassing an area greater than the area of said geometric object when the arms are in the closed position;

a hinge pivotally connecting one end of said arms together, said hinge pivoting about a pivot point exteriorly displaced from said arms;

a plurality of pins of predetermined length reciprocably connected to both of said arms at incremental locations along the length of both of said arms;

a mounting block, connected to the end of said arms, to support the hinge at a raised position above said arms; and

latching means located at a second end of said arms, said latching means to thereby releasably connect said arms in the closed position.

4,275,507

DEVICE FOR AUTOMATIC MEASUREMENT FOR ENGAGEMENT PITCH OF THE THREAD ON SCREW-LIKE WORK PIECES

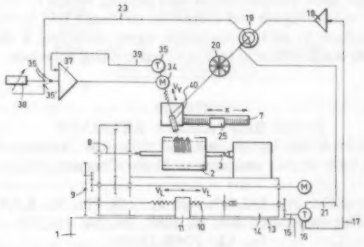
Rainer von Haas, Geesthacht, Fed. Rep. of Germany, assignor to Firma Wilhelm Fette GmbH, Schwarzenbek, Fed. Rep. of Germany

Filed Jul. 10, 1980, Ser. No. 167,321

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1979, 2930078

Int. Cl.³ G01B 7/28

U.S. Cl. 33—199 B **10 Claims**



1. A device for measuring engagement pitch of a thread of a screw-like work piece, comprising means for rotating the work piece about its center axis; a measuring slider movable in a straight path directed transversely at an adjustable angle to said center axis, said measuring slider including a feeler for slidably engaging a flank of the thread of the work piece;

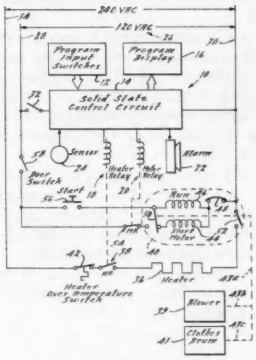
electrical driving means for imparting movement to said measuring slider in said transverse path; means for imparting a relative axial displacement between said measuring slider and the rotating work piece; a sensor coupled to said axial displacement means to generate a signal proportional to the rate of the relative axial displacement; a sinusoidal potentiometer mechanically coupled to said angularly adjustable measuring carriage and being electrically connected to the output of said sensor and to said driving means to adjust the transverse feed of the measuring slider to the rate of the axial displacement; and means coupled to said measuring slider for measuring deviations of said transverse path from the base set angle.

4,275,508

CLOTHES DRYER TEMPERATURE CONTROL SYSTEM

William H. Jones, Villa Park, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 9, 1980, Ser. No. 110,580
Int. Cl.³ F26B *21/06*
U.S. Cl. 34—43 **9 Claims**



1. A control system for a clothes dryer comprising:

a. heating means operable upon selective actuation to heat air in a region for drying clothes;

b. selector means operative upon operator actuation to select one from a plurality of predetermined cooling temperature schedules;

c. a single sensor receiving said selected cooling schedule and operative to provide a temperature signal having a predetermined ratio to the schedule selected and which varies in continuous relationship to the air temperature in said region; and

d. control means receiving said temperature signal and operative upon deactuation of said heating means to cool the air in said region and thereafter terminate said cooling in response to said temperature signal matching a desired final temperature in said selected cooling schedule.

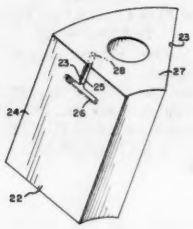
4,275,509

FLUID BED NOZZLE RETAINER

Kenneth H. Kline, Catasauqua, and Walter W. Kramer, Allentown, both of Pa., assignors to Fuller Company, Bethlehem, Pa.

Division of Ser. No. 892,639, Apr. 3, 1978, Pat. No. 4,207,682. This application Jan. 10, 1980, Ser. No. 110,971
Int. Cl.³ F26B *17/10*
U.S. Cl. 34—57 R **1 Claim**

1. A refractory block adapted to be joined to similar refractory blocks including a T-shaped groove in opposite sides thereof; the T-shaped grooves of adjacent blocks adapted to surround and hold a T-shaped bolt between the adjacent blocks; said T-shaped grooves being positioned in the sides of said block and said T-shaped bolt having a leg of a length sufficient to extend beyond a surface of said block which is at an angle to the side of the block in which the T-shaped groove is located, and a wear resistant plate adapted to lie atop said



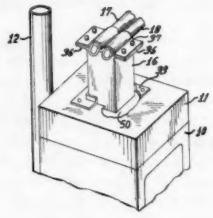
surface of said block and having openings therethrough for receiving the leg of said T-shaped bolt and fastener means operatively associated with said T-shaped bolt for securing said wear resistant plate to said surface of the block.

4,275,510

HEAT RECOVERY IN A LAUNDRY SYSTEM

Odean F. George, P.O. Box 6734, Jacksonville, Fla. 32205

Filed Jun. 1, 1979, Ser. No. 44,509
Int. Cl.³ F26B *11/04*
U.S. Cl. 34—90 **5 Claims**



1. In a laundry system comprising a washer employing hot water, a dryer having a fire box, a water heater, and water pipe circulating system conducting cool water to said water heater and distributing hot water to said washer, the improvement which comprises a heat pipe having the bottom thereof in heat conductive contact with the outside surface of said fire box of said dryer and the top of said heat pipe in heat conductive contact with said water pipe circulation system spaced above said dryer in the portion thereof conducting cool water to said water heater.

4,275,511

EVAPORATOR/SUBLIMATOR FLASK APPARATUS

Martin Parkinson, Nyack, N.Y., and Michael V. Dimitroff, Demarest, N.J., assignors to Bio-Vac Incorporated, Nyack, N.Y.

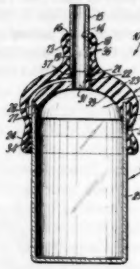
Filed Dec. 26, 1979, Ser. No. 107,268
Int. Cl.³ F26B *13/30*
U.S. Cl. 34—92 **10 Claims**

1. An evaporator/sublimator flask apparatus for connection to a vacuum connector tube comprising:

a substantially cylindrical body having a base at one end and being open at the other end, and,

a cap of an elastomeric material mounted over the body comprising an upper neck portion having an aperture therethrough for insertion of a vacuum connector tube, an intermediate outwardly sloping shoulder portion and downwardly extending outer walls having an inwardly

extending flange at the bottom surface thereof, whereby said cap engages said bottom surface, and a first vacuum path within the cap leading from the cylindrical body to the neck portion whereby the neck collapses about said vacuum connector tube when a vacuum is applied



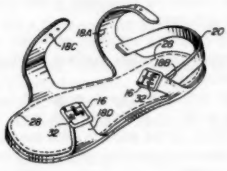
through the tube and a second vacuum path within the cap from the cylindrical body to the interior of the outer wall so that the outer walls collapse about the body forming tight seals when a vacuum is applied to the apparatus through the tube.

4,275,512

SANDAL STRUCTURE

Robert Zeligman, and John R. Zengerle, both of Tucson, Ariz., assignors to Frontier Footwear Corporation, Tucson, Ariz.

Filed Oct. 22, 1979, Ser. No. 87,418
Int. Cl.³ A43D 9/00; A43B 3/12
U.S. Cl. 36—11.5 **5 Claims**



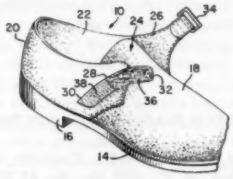
1. A sandal comprising in combination:
a. a foot-shaped sole, said foot-shaped sole being composed of composition rubber material;
b. a foot-shaped lower insole, said foot-shaped lower insole being substantially thinner than said foot-shaped sole;
c. an upper insole section, said upper insole section having a foot-shaped section and a plurality of straps integral with said foot-shaped section, said straps extending from edges of said foot-shaped section, said upper insole section including four of said straps, first and second ones of said straps each extending from an instep edge of said upper insole section and having first and second buckles attached thereto, said first and second straps being spaced apart, substantially parallel, and inclined substantially forward toward a toe end of said upper insole section when said upper insole section is flat, third and fourth ones of said straps each extending from an edge of said upper insole section opposite to said instep edge and having a plurality of tongue-receiving holes therein for receiving the tongue of a respective one of said buckles, said first buckle being fastened to said fourth strap and said second buckle being fastened to said third strap, said third and fourth straps being spaced apart, substantially parallel, and inclined substantially forward toward the toe end of said upper insole section when said upper insole section is flat;
d. means for attaching the lower surface of said upper insole section to the upper surface of said lower foot-shaped insole, said attaching means including a plurality of stitches extending through said upper insole section and said foot-shaped lower insole, said plurality of stitches being disposed along the entire periphery of said lower foot-shaped insole;
e. means for adhesively bonding the lower surface of said lower foot-shaped insole to the upper surface of said foot-shaped sole; and
f. a leather heel strap having opposed ends attached by means of stitches to said second and third straps.

4,275,513

ADJUSTABLE AND FLEXIBLE CLOSURE ASSEMBLY FOR MONK STYLE SHOES

Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204

Filed Dec. 20, 1978, Ser. No. 971,183
Int. Cl.³ A43B 11/00
U.S. Cl. 36—50 **16 Claims**



1. A monk style shoe having a sole and uppers, said uppers including an undivided vamp and quarters with a variable opening formed between said quarters and the upper portion of said undivided vamp, the improvement including an adjustable and flexible closure assembly comprising a flexible, multi-adjustable, separable fastener means having first and second fastening members including arrays of complementary, coacting flexible gripping elements for securing said closure assembly; a fastener strap included on one side of said shoe having a fixed portion and a free end, said free end including said first fastening member, said second fastening positioned adjacent said fixed portion of said fastener strap; and one of said quarters opposite said fastener strap having an integral, elongated extension with an opening for receiving said fastener strap through which the free end of said fastener strap passes permitting the uppers of said shoe to be pulled inwardly simultaneously perrmitting adjustment to the precise desired tautness of said closure assembly to fasten said shoe.

4,275,514

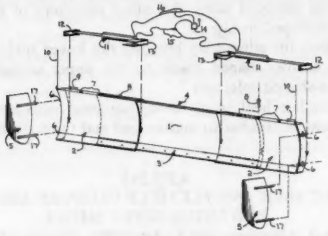
SNOWPLOW EXTENSIONS

Nicholas J. Maura, R.D. #1 Birchwood Dr., Box 192, Duanesburg, N.Y. 12056

Filed Jan. 28, 1980, Ser. No. 115,714
Int. Cl.³ E01H 5/00
U.S. Cl. 37—42 R **3 Claims**

1. A snowplow and snowplow extensions combination comprising:
spring-loaded curved moldboard having a bottom edge and a top edge and a replacement cutter located along said bottom edge with a molded in track extending along the length of said replacement cutter, a guiding track attached to said top edge and having spaced adjustment holes; a pair of extension wings having a top guide slidable engaging said guiding track, a bottom guide slidable engaging said molded in track, said extension wings being curved in contour with said curved moldboard; said top guide having a handle attached for ease in sliding and upright plow guides mounted to the outside corners of said top guide, said top guide having spaced adjustment holes therein, a

manual operable position adjustment holding pin for extending through said adjustment holes of said guiding



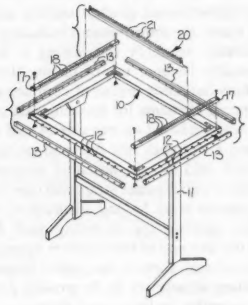
track and top guide when aligned to thereby manually fasten and hold said extension wings in position.

4,275,515

APPARATUS FOR MAKING A HANDCRAFTED PILE RUG

Betty R. Hinson, 5319 Milford Rd., Charlotte, N.C. 28210

Filed Jul. 27, 1979, Ser. No. 61,281
Int. Cl.³ D05C *1/02*; D06C *3/08*
U.S. Cl. 38—102.91 **10 Claims**



1. An apparatus for use in making handcrafted pile rugs comprising

a frame adapted for holding a backing fabric in an outstretched condition, and

an elongate pile forming guide extending transversely across said frame so as to overlie the backing fabric and being adapted to facilitate forming a row of pile loops on the backing fabric,

said pile forming guide having means provided at spaced locations therealong around which a yarn may be successively looped and then sewn into the backing fabric for forming a row of spaced pile loops across the backing fabric, and

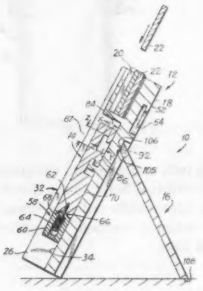
said frame including a pair of elongate mounting strips removably secured to said frame along opposite side edges thereof, each mounting strip having a series of evenly spaced slots therein adapted for receiving an end portion of said pile forming guide to permit securing the pile forming guide to the frame at a series of evenly spaced locations thereacross for forming successive evenly spaced rows of pile loops on the backing fabric.

4,275,516

PERMANENT CALENDAR CONSTRUCTION

Ronald S. Lane, 406 Deer Creek Dr., Plainsboro, N.J. 08536

Continuation-in-part of Ser. No. 966,165, Dec. 4, 1978, which is a continuation-in-part of Ser. No. 798,273, May 19, 1977, which is a continuation-in-part of Ser. No. 722,925, Sep. 13, 1976, abandoned. This application Feb. 8, 1979, Ser. No. 10,336
The portion of the term of this patent subsequent to Mar. 6, 1996, has been disclaimed.
Int. Cl.³ G09F *3/00*
U.S. Cl. 40—107 **5 Claims**



1. An improved parmanent calendar assembly to precisely display any month of the year except February and reflect the number of days in the desired month, said assembly having a date column area, a plurality of date columns, and means to detachably mate said columns to said date column area, the improvement comprising:

a reversible mounting structure to the lower end of one of said date columns;

said structure having opposed surfaces, one surface being unnumbered, the other surface having the numeral **31** placed thereon;

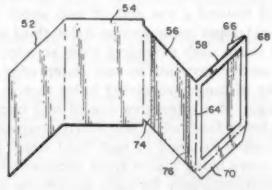
whereby the structure is easily adjusted to reflect the correct length of a 30 or 31 day month with either the unnumbered surface or the surface with the numeral **31** in visual display allowing precise display of only eleven of the twelve months for economic consideration, the supporting structure being retained in securement to the date column while said column hangs from the date column area, said mounting structure being uneffected by gravitational slip in the absence of underlying support.

4,275,517

PHOTOGRAPH MOUNT

Roland H. Blanchard, New Bedford, Mass., assignor to Winthrop-Atkins Co., Inc., Middleboro, Mass.

Continuation of Ser. No. 779,198, May 23, 1977, abandoned. This application Feb. 1, 1979, Ser. No. 8,389
Int. Cl.³ A47G *1/06*; G09F *1/10*
U.S. Cl. 40—158 R **1 Claim**



1. A photograph mount comprised of four rectangular pan-

els of relatively stiff cardboard, a first panel comprising an imperforate back board, a second panel comprising an imperforate intermediate board, said intermediate board being positioned with its front side in contact with the front side of the back board, hinge means connecting one edge of the intermediate board to one edge of the back board, adhesive affixing the intermediate board in contact with the back board, a third panel comprising a face board, said face board being positioned with its back side in contact with the back side of the intermediate board, hinge means connecting an edge of the face board to the distal edge of the intermediate board, adhesive affixing the back side of the face board in contact with the back side of the intermediate board, said face board containing a window opening, said face board having along its distal edge and along its lower edge hinged flaps disposed, respectively, between the face board and the intermediate board and against the front side of the intermediate board between it and the back board, adhesive affixing the flaps, respectively, to the opposite sides of the intermediate board and to the back board, said intermediate board constituting the back of a pocket comprised of the intermediate board, face board and flaps secured to the front side of the back board, said pocket being closed at the bottom along the opposite sides and open at the top, said pocket being of a front to back depth perpendicular to the face board substantially equal to the thickness of the material of which the structure is comprised for slidingly receiving a photograph for display through the window opening, a fourth panel comprising a cover board and hinge means connecting an edge of the cover board to the opposite edge of the back board so that it can be folded over the intermediate board and face board to cover the same, said pocket defined by the intermediate and face boards being narrower in width and shorter in length than the back board and cover board so as to be completely concealed by folding of the cover board over the back board.

4,275,518

DECORATIVE PLATE AND METHOD OF MAKING SAME

Lindley Martin, Gold Coast, Australia, assignor to Roderick R. Mayze, Paradise Point, Australia

Filed Jan. 2, 1979, Ser. No. 345

Claims priority, application New Zealand, Mar. 29, 1978, 186798

Int. Cl.³ A45C *11/00*

U.S. Cl. 40—324 **3 Claims**

1. A decorative plate comprising an outer part of a rigid material having a flat outer base and a curved outer wall, a transparent part of a flexible plastic material having a flat inner base and curved inner wall and an upper peripheral edge, said inner base and inner wall being complementary to the shape of the interior of said outer part, an integral inturned peripheral lip on said outer wall of said outer part, whereby the said parts may be secured together with a "snap-fit" action by said edge snapping under said lip and may be conveniently detached as desired by prying said edge from under said lip, and a photographic print positioned between said parts visible through said inner part, said photographic print being adhered to the back of said inner part.

4,275,519

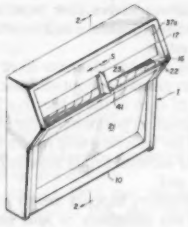
WALL MOUNTED TELEPHONE INDEX

Jerome A. Grunstad, West St. Paul, Minn., assignor to Ketcham & McDougall, Inc., Roseland, N.J.

Filed Sep. 17, 1979, Ser. No. 75,940

Int. Cl.³ B42F *17/34*

U.S. Cl. 40—378 **10 Claims**



1. A wall mounted telephone index comprising, in combination, a housing having a rear wall, a top wall, a pair of side walls defining an interior, and a front opening, means on said housing rear wall for mounting said housing in a vertically extending position on the surface of an associated wall structure, index card mounting means on said housing for positioning an associated stack of index cards, each of said index cards having an upper edge provided with an index tab and a lower edge provided with spaced slots for mounting said stack of index cards in said housing interior in an upstanding position for pivotal movement downwardly by gravity from a stored position in said housing interior to a dropped position supported by said door, a flange integral with said top wall extending downwardly between said pair of side walls to the front of said rear wall, a slidable index card selector mounted on said flange integral with said housing top wall for sliding movement relative to said flange into a a selected position for retaining engagement with a tab on a selected one of said index cards to be displayed, a door for enclosing said housing front opening, means for pivotally mounting said door on said housing for pivotal movement between a closed position in closing relationship with said front opening to retain said stack of index cards in said upstanding position and a dropped position to open said front opening of said housing thereby permitting the index cards in said stack overlying said selected one of said index cards to fall by gravity into said dropped position.

4,275,520

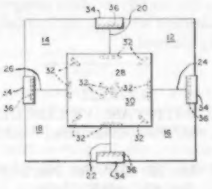
MODULAR PLANE SURFACE DISPLAY STRUCTURE

Harold L. Appleton, Needham, and Douglas R. Kingston, Norwood, both of Mass., assignors to Appleton-Kingston, Inc., Needham, Mass.

Filed May 18, 1979, Ser. No. 40,111

Int. Cl.³ G09F *7/02, 7/20*

U.S. Cl. 40—605 **8 Claims**



1. In a modular single plane display surface structure the combination of

a. at least four panel sections with each panel section having

only single plane surface side edges and with each panel section having only a single plane front and only a single plane back face and the single plane surface edges abutting the single plane surface edges of adjacent panel sections in manner such that the front of said panel sections form said single plane display surface about a common juncture of respective four panel sections,

b. a plane surface support panel on a portion of the back face of each of said respective four panel sections about the associated common juncture and overlapping portions of said abutting edges,

c. loop and hook fastener elements fixed to said panel sections at support positions about said associated juncture on the back face of each of the respective four panel sections and to corresponding positions on the plane surface of said support panel for fastening said support panel and respective four panel sections firmly together with capacity for dissassembly, and

d. removable periphery support means at each of the abutting edges at the periphery of said single plane display surface, comprising a periphery support member overlapping each of said abutting edges on both the front and back faces of said panel sections whereby the support members and panel sections are firmly held together with capacity for disassembly.

4,275,521

ELECTRO-MECHANICAL TRIGGERING MECHANISM FOR FIRE ARMS

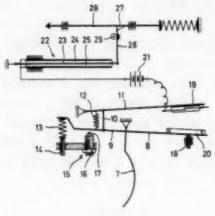
Friedrich Gerstenberger, Dürnau; Wolfgang Loos, Munderkingen, and Dieter Straub, Ulm, all of Fed. Rep. of Germany, assignors to J. G. Anschutz, GmbH, Fed. Rep. of Germany

Filed Apr. 17, 1979, Ser. No. 30,822

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1978, 2818834

Int. Cl.³ F41C *19/12*

U.S. Cl. 42—84 **21 Claims**



1. Electro-mechanical triggering mechanism for fire arms, comprising a signal receiver used as an input unit which converts a shot-triggering signal generated by the user into an electrical signal, and an electro-mechanical converter forming an output unit which receives the electrical signal from said input unit and acts on a shot-triggering element to trigger the shot, the improvement consisting in that the electro-mechanical converter is an electrically or electromagnetically deformable piezo-active element which is mechanically connected to said shot-triggering element.

4,275,522

BAIT BOX WITH PASSIVE CIRCULATION

William T. Glover, 4467 New Haven Ave., West Melbourne, Fla. 32901

Filed Mar. 28, 1979, Ser. No. 24,874

Int. Cl.³ A01K *97/04*

U.S. Cl. 43—56 **12 Claims**

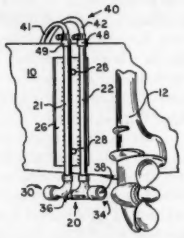
1. A passive circulation storage box of the type used on boats for storing fish, bait and the like, comprising in combination:

a container for receiving and storing water therein;

first and second tubes extending below the bottom of the boat;

said first tube having a first end thereof oriented for collecting water under pressure as the boat moves through the body of water;

said second tube having a first end thereof orieted so as to siphon water therefrom;



first valve means coupled to a second end of said first tube for regulating the flow of water into said container, said first valve means including means for sensing the level of water in said container and for regulating the flow of water therethrough so as to retain a predetermined level of water within said container; and wherein

a second end of said second tube movably couples through said container so as to be adjustable in vertical level for siphoning water therefrom.

4,275,523

DEVICE FOR KEEPING UNDER CONTROL A POPULATION OF SELECTED SPECIES OF INSECTS

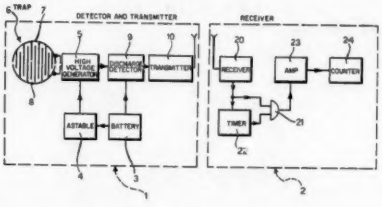
Mario Baima, Turin, and Gian P. Tavoni, Cambiano, both of Italy, assignors to Centro Ricerche Fiat S.p.A., Orbassano Turin, Italy

Filed Mar. 14, 1979, Ser. No. 20,582

Claims priority, application Italy, Mar. 24, 1978, 67666 A/78

Int. Cl.³ A01M *1/22*

U.S. Cl. 43—112 **7 Claims**



1. A device for use in keeping insect infestations under control; said device comprising:

at least one trap,

electrical conductor means on said at least one trap,

a high voltage generator,

said electrical conductor means being connected across the output of said voltage generator and being so formed as to produce an electrical discharge when an insect above a given size comes into contact with said electrical conductor means,

radio transmitter means,

discharge detector means operable to detect electrical discharges across said electrical conductor means and to enable, in response thereto, and for a limited time period, operation of said radio transmitter means,

radio receiver means for receiving signals transmitted by said radio transmitter means,

an impulse counter means connected to the output of said radio receiver means, said impulse counter means operating to count each time said transmitter means is operated, whereby to provide an indication, at a location remote from said trap of the number of insects trapped thereby, and

an astable circuit interposed between said high voltage generator and an electrical voltage source therefor, said astable circuit operating to feed said high voltage generator from said voltage source at spaced intervals,

wherein said high voltage generator includes:

an oscillator,

a first step-up transformer having a primary winding and a secondary winding, the output of said oscillator being connected to said primary winding of said step-up transformer,

a first capacitor,

the secondary winding of said first step-up transformer being connected to said first capacitor,

a trigger unit and a circuit interruptor,

a second step-up transformer having a primary winding and a secondary winding, said trigger circuit controlling the connection of said first capacitor to said primary winding of said second step-up transformer through said circuit interruptor,

a second capacitor connected across said secondary winding of said second step-up transformer and said electrical conductor means of said at least one trap, and

a diode connected between said secondary winding of said second step-up transformer and one terminal of said second capacitor.

4,275,524

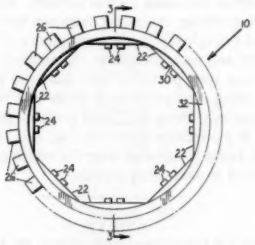
REMOVABLE TIRE FOR CONSTRUCTION SET JOINT ELEMENT

Richard J. Gabriel, Portland, Oreg., assignor to Matrix Toys, Inc., Portland, Oreg.

Filed Mar. 19, 1979, Ser. No. 21,924

Int. Cl.[3] A63H *33/04*

U.S. Cl. 46—23 **1 Claim**



1. A tire for a generally spheriodal construction set joint element of the type having multiple planar facets with joint openings located therein, with a portion of said facets circumscribing said joint element in a particular defined pattern, said tire comprising:

(a) a yieldable annular rim having a width substantially equal to the width of said facets;

(b) lugs located at spaced intervals around said rim on the outer surface thereof;

(c) a plurality of planar engaging surfaces located on said rim on the inner side thereof, said engaging surfaces being arranged in the shape of said particularly defined pattern, and being substantially the same size as said portion of said facets so that each one of said surfaces is located adjacent to an associated one of said portion of said facets when said tire is positioned around said joint element;

(d) wherein said rim has a width which is slightly greater than the width of said portion of said facets, and includes opposed side walls each comprising:

(1) a thin annular ring having a radially outer margin which is coincident with the radially inward extremity of said lugs, and a radially inner margin which intersects lines formed between the common edges of adjacent ones of said engaging surfaces; and

(2) a plurality of pads, having the cross-sectional shape of a circular segment which extend between said ring and said engaging surfaces and which are offset inwardly from said ring.

4,275,525

HOUSING WITH MOTOR AND SOLAR CELL

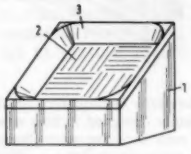
Diether Geisler, Grosshansdorf, and Joachim Eckert, Prisdorf, both of Fed. Rep. of Germany, assignors to Beiersdorf AG, Hamburg, Fed. Rep. of Germany

Filed Apr. 23, 1979, Ser. No. 32,333

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1978, 7813145[U]; Jun. 10, 1978, 2825610

Int. Cl.[3] A63H *33/30*

U.S. Cl. 46—39 **13 Claims**



1. A unitary drive module for a model toy comprising:

a housing means suitable for mounting in association with said toy, said housing means comprising a pair of contiguous housings;

a motor contained within said housing means, said motor having an output shaft extending from said housing means and couplable to moving parts of the model toy for driving same;

at least one solar cell mounted on the exterior of each of said housing and electrically connected to said motor for energizing the motor, said solar cells being orientable toward a light source, said solar cells being connected in an anti-parallel circuit; and

an adjustment drive for changing the position of the solar cells connected in said anti-parallel circuit.

4,275,526

THERMAL-BREAK WINDOW

Harold B. Abramson, 30 Stearns Rd., Brookline, Mass. 02146

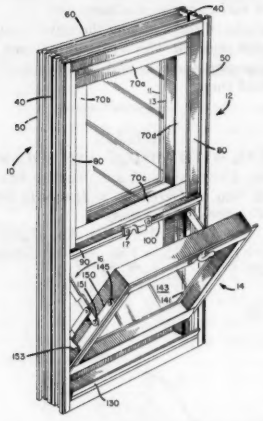
Filed Aug. 24, 1979, Ser. No. 69,531

Int. Cl.[3] E06B *3/00*

U.S. Cl. 49—501 **13 Claims**

1. A window of the type in which the frame encasing the glass panel is provided with a thermal-break and comprising a pair of side jambs and adaptors, a head and top and bottom sill members, and a plurality of glazing beads interconnected to form a substantially rectangular frame for encasing a glass panel secured within a plurality of rails in which each said jambs, adaptors, head and sill members are extrusion formed of metal with a channel along their respective axial lengths, said channel containing an elastomeric material of low thermal coefficient and with a strip of the extruded metal material along said channel being removed, effectively separating each of said extruded parts into two sections along their entire lengths, representing exterior and interior sections, that remain joined only by said material of low thermal coefficient, thermally insulating thereby said exterior from said interior sections, said adaptors designed to snap-fit to said side jambs, a

pair of said plurality of glazing beads designed to snap-fit to said adaptors, a second pair of said plurality of glazing beads designed to snap-fit to said top and bottom sill members, each of said plurality of glazing beads provided with a mortise removably to accommodate therein a deformable bulb of tubu-



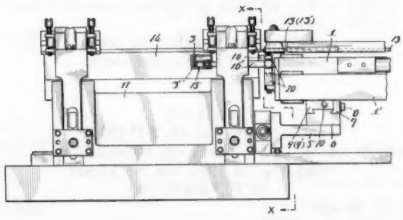
lar construction having a T-shaped leg fitting into said mortise, said deformable bulbs designed to bear against the surfaces of said plurality of rails securing said glass panel therein, said deformable bulbs resiliently holding said glass panel and also providing an additional thermally insulating barrier between said exterior and said interior sections.

4,275,527

CENTERLESS GRINDING MACHINE

Michimasa Daito, Hama-matsu, and Tohru Sugino, Shizuoka, both of Japan, assignors to Nissin Machine Works, Ltd., Japan

Filed Jul. 18, 1979, Ser. No. 58,512
Int. Cl.³ B24D *5/18*
U.S. Cl. 51—103 TF **4 Claims**



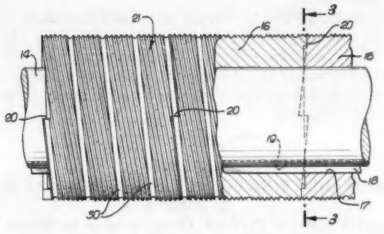
1. In a centerless grinding machine comprising a rotatably mounted grinding wheel, a rotatably mounted regulating wheel opposing said grinding wheel in spaced relationship to the grinding wheel to define a clearance between the wheels corresponding to a desired finished size of a workpiece to be ground by said grinding machine, a blade positioned in said clearance to support said workpiece and a gaging device for detecting variations in the positions of the surfaces of the grinding and regulating wheels, the improvement comprising a gaging device having a first detector adapted to detect variations in the position of the surface of said grinding wheel and having a first measuring head, a first finger member connected at one end of said first measuring head and a contact connected to the other end of said first finger engaging the grinding surface of said grinding wheels, a second detector adapted to detect variations in the position of the surface of said regulating wheel and having a second measuring head, a second finger connected at one end to said second measuring head and a second contact connected to the other end of said second finger engaging the surface of said regulating wheel, said blade being provided with an opening having dimensions larger than the combined length and height of said first and second contacts to freely receive said contacts, and further comprising a common slide block fixedly secured to a mounting base, said first and second measuring heads being adjustably mounted on said slide block for finely adjusting the positions of said first and second heads, and discharge conveyors disposed on said discharge side of the grinding and regulating wheels for receiving and discharging ground workpieces from said grinding machine.

4,275,528

ELECTROPLATED DIAMOND MILLING CUTTER

Eugene E. Higginbotham, Salt Lake City, Utah, assignor to Christensen, Inc., Salt Lake City, Utah

Filed Sep. 10, 1979, Ser. No. 73,920
Int. Cl.³ B24B *7/00*
U.S. Cl. 51—206 P **22 Claims**



1. A milling cutter comprising a generally cylindrical body adapted to be rotated about an axis and having a helical thread extending around its periphery through a plurality of revolutions, said thread including a crest portion, a root portion and tapered flank portions extending between said crest and root portions, and a single layer of a multiplicity of diamond particles bonded to and extending from the external surfaces of said crest, flank and root portions, said diamond particles of said single layer being contiguous each other and overlapping each other progressively along said crest portion, flank portion and root portion in a direction normal to said axis, the width of said crest portion being no greater than the width of each diamond particle bonded to said crest portion.

4,275,529

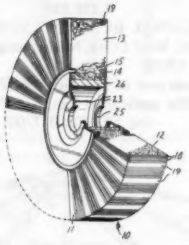
HIGH FLAP DENSITY ABRASIVE FLAP WHEEL

Michael L. Teetzel, Columbus Twp., Anoka County, and Ralph E. James, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Aug. 28, 1979, Ser. No. 70,691
Int. Cl.³ B24B *9/02*; B24D *11/00*
U.S. Cl. 51—334 **4 Claims**

1. A rotative abrasive flap wheel comprising an annulus of approximately equal-sized, substantially rectangular, substantially like-oriented, coated abrasive flaps, each of said coated abrasive flaps being characterized by having an abrasive face, an inner end and an opposite outer flap end, said coated abrasive flaps having said abrasive faces in the same direction and being interleaved with compressible, lofty, non-woven flaps characterized by having inner ends, opposite outer flap ends, a compressed thickness adjacent said inner end and an uncompressed thickness adjacent said outer flap end, said coated abrasive flaps and said non-woven flaps being fastened adhe-

sively together at said inner ends by adhesive which extends along that portion of said flaps adjacent said inner ends part way into the annulus to define a zone comprised of solidified adhesive and with said outer flap ends being free, said inner ends of at least said coated abrasive flaps defining a tubular surface providing an opening capable of receiving an arbor, said inner ends of said non-woven flaps extending a distance at



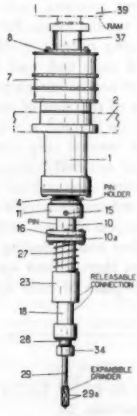
least partially into said zone so that said non-woven flap inner ends are sufficiently anchored to resist removal in use, said coated abrasive flaps and said non-woven flaps being present in said wheel to provide a number ratio of coated abrasive flaps to non-woven flaps in a range of about 15:1 to about 1:5, said compressed thickness being less than about 35% of said uncompressed thickness for non-woven flap inner ends extended to said tubular surface.

4,275,530

GRINDING HEADS FOR GRINDING MACHINES

Pierre A. Largeteau, Bezons, France, assignor to Societe Anonyme Automobiles Citroen and Automobiles Peugeot, both of Paris, France

Filed Mar. 2, 1979, Ser. No. 17,079
Claims priority, application France, Mar. 6, 1978, 78 07211
Int. Cl.³ B24B *5/00*
U.S. Cl. 51—355 **13 Claims**



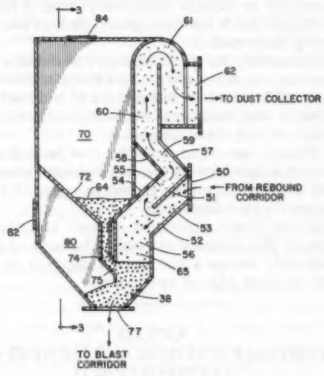
1. A grinding head comprising:
an expandable grinder;
a tubular grinder holder supporting said grinder;
an expansion cone received in said grinder and axially displaceable therein to expand said grinder;
an expansion rod connected to said expansion cone and extending through said tubular grinder holder;
a ram remote from said expansion cone and operable to control expansion of said grinder;
a rotatable tubular drive pin surrounding said rod and operatively connected to said grinder for rotating same;
a coupling member operatively connected to said ram and rotatably and axially received in said pin holder;
first helical coupling means connecting said coupling member to said expansion rod for joint rotation of said expansion rod and said coupling member but for relative rotation of said expansion rod and said coupling member upon axial displacement of said coupling member by said ram; and
second helical coupling means connecting said pin and said expansion rod for fixing said expansion rod and said cone for joint rotation with said expansion rod and for axially displacing said cone upon relative rotation of said expansion rod and said pin holder.

4,275,531

ABRASIVE PARTICLE BLAST APPARATUS FOR SURFACE TREATMENT

Harvey G. Van Fossen, Mishawaka, Ind., assignor to Wheelabrator-Frye, Inc., Hampton, N.H.

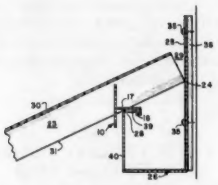
Continuation-in-part of Ser. No. 925,116, Jul. 17, 1978, Pat. No. 4,202,142. This application Nov. 19, 1979, Ser. No. 95,771
Int. Cl.³ B24C *3/06, 9/00*
U.S. Cl. 51—425 **8 Claims**



1. An apparatus for treatment of surfaces by projecting dry particulate material at high velocity onto the surface, including a projecting means for projecting the particulate material, a feed hopper, means for feeding particulate material from the feed hopper to the projecting means, and means for returning particulate material, dust and dirt from the surface to a level above the feed hopper, the improvement comprising separating means for separation of particulate material from dust and dirt for recycle of the separated particulate material to the feed hopper including a separating chamber, the lower end portion of which communicates with the feed hopper, an inlet opening in a lower portion of the separating chamber but above the feed hopper and through which the returning particulate material, dust and dirt are introduced into the separating chamber and an outlet in communication with an upper portion of the separating chamber, means for causing an air stream to flow continuously from the inlet to the outlet of the separating chamber, for causing the air stream to flow in sequence downwardly and forwardly for a short distance from the inlet into the separating chamber and then in a reverse direction for flow upwardly and rearwardly in the opposite direction through the separating chamber, with a further change in direction to flow upwardly and inwardly into the passage communicating with the outlet from the separating chamber whereby particulate

material becomes separated for return to the feed hopper while dust and dirt remains suspended in the air stream for flow with the air stream through the outlet opening.

4,275,532
SHIELD DEVICE AND ROOF STRUCTURE CONTAINING SAME
Roy W. Watson, 3218 Woodrow Ave., Richmond, Va. 23222
Filed Jun. 11, 1979, Ser. No. 47,440
Int. Cl.³ A01K *3/00*; E04B *1/72*; E04H *9/16*
U.S. Cl. 52—15 **2 Claims**



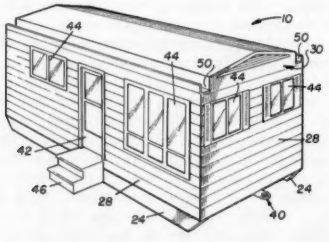
2. An inclined roof structure comprised of corrugated panels, a gutter having an outer edge and inwardly disposed lip associated therewith, said panels being supported by resting abutment with said outer edge, and a multitude of shield devices positioned by enclasping frictional engagement with said lip in a manner to occlude passageways leading from the underside of said panels into said gutter, each of said shield devices being comprised of:

(a) a substantially flat shield member contoured so as to have a vertical axis of symmetry and a lower edge which, when measured horizontally in the plane of said shield member, is longer than horizontal dimensions adjacent the upper portion of said shield member,

(b) a bracket associated with the rear face of said shield member at substantially the center thereof comprised of a shelf portion originating at said rear face and extending rearwardly therefrom, and

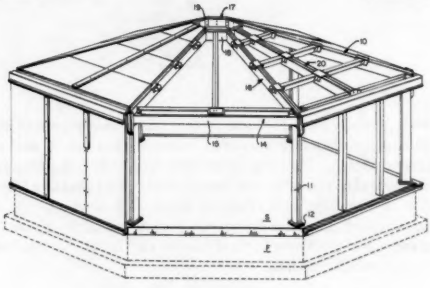
(c) gripping means positioned beneath said shelf portion adjacent the rearward extremity thereof and adapted to frictionally engage a horizontally disposed lip associated with the front edge of said gutter.

4,275,533
PORTABLE BUILDING AND METHOD OF TRANSPORTING IT
Darold L. Wright, 1151 Calhoun St., Hayward, Calif. 94544
Filed Aug. 22, 1979, Ser. No. 68,705
Int. Cl.³ E04H *1/00, 1/12*
U.S. Cl. 52—79.1 **11 Claims**



1. In a portable building of the type having a floor, side walls and a roof fixedly interconnected with each other, the combination comprising skid means mounted on the floor of the building and arranged generally adjacent the lateral edges thereof for engaging the ground and supporting the building in a freestanding condition, reinforced slide means formed beneath the floor of the building inwardly of said skid means for engaging supporting structural chassis members of a transport vehicle and withstanding stress of sliding the building onto and off of the vehicle during loading and unloading, and means structurally interconnected with the building for sliding it onto and off of the vehicle.

4,275,534
HEXAGONAL BUILDING STRUCTURES
William H. Porter, West Olive, Mich., assignor to W. H. Porter, Inc., Holland, Mich.
Continuation-in-part of Ser. No. 805,781, Jun. 13, 1977, abandoned. This application Jan. 5, 1979, Ser. No. 1,311
Int. Cl.³ E04B *7/00*
U.S. Cl. 52—82 **8 Claims**

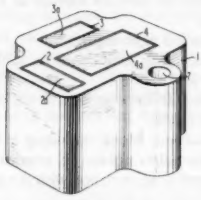


1. A metal frame for a building structure of six or eight sides and adapted to have no interior roof-supporting columns comprising a plurality of upright tubular metal support columns; means for securing the bottom of each column to a base; a tubular metal truss extending upwardly from each column toward the center of said structure; a rigid, integral compression ring connecting the inner ends of all of said trusses; a tension ring connecting the outer ends of all of said trusses and including a plurality of individual tension ring members extending between adjacent columns; each of said tension ring members comprising a tubular beam formed from C-shaped channel members in facing relation welded together and including an end plate at each end, and a transition channel secured to the top thereof and defining a portion inclined at the same angle as the slope of the roof of said structure and cut away at the center portion thereof; a plurality of roof rafters extending between said tension ring members adjacent the cut-away portion thereof and said compression ring; first fastener means for connecting each column to the end plates of adjacent tension ring members, each truss comprising a tubular beam formed from C-shaped channel members in facing relation and welded together and including an end connecting member rigidly attached thereto; and second fastener means for connecting said end plate of each truss to an associated column.

4,275,535
CONSTRUCTION SURVEY LATH-STAKE BASE
Kenneth R. Stalzer, Naperville, Ill.
Filed Oct. 24, 1979, Ser. No. 87,785
Int. Cl.³ E02D *27/42*
U.S. Cl. 52—100 **7 Claims**

1. A construction survey lath-stake base comprising a block having a top surface and a bottom surface, a plurality of vertically extending apertures formed through said block, a construction survey lath adapted to be inserted into one of said apertures, a construction survey stake adapted to be inserted into another of said apertures, the bottom surface of the block

being supported on the surface of the ground to be surveyed, the top surface of the block being of an extent to provide a



writing surface upon which line and distance readings may be recorded, and means securing said block to the ground.

4,275,536

WALL ELEMENT FOR A CONSTRUCTION WALL

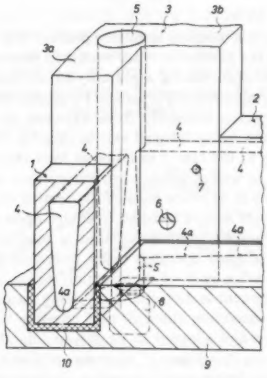
Karl H. Vahlbrauk, Kriegerweg 1, 3353 Bad Gandersheim, Fed. Rep. of Germany

Filed Dec. 11, 1979, Ser. No. 102,853

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1978, 2856851

Int. Cl.³ E04B *5/48*

U.S. Cl. 52—220 **13 Claims**



1. A wall element for a construction wall to be associated with sanitary objects, comprising a body portion completely constituted of a self-supporting shrinkage-free ceramic foam material; and means for forming at least one conduit for draining water, said conduit forming means including a channel-shaped gas-tight and water-tight inner hollow which is substantially horizontal and having an inclined sole, said substantially horizontal inner hollow extending over a region of said body portion, which normally serves for the connection of a plurality of sanitary objects to be differently arranged relative to the construction wall, and having a height corresponding to the region of the requisite draining lines of said differently arranged sanitary objects, so that said different sanitary objects can be connected with the same inner hollow and thereby it is not necessary to provide a plurality of separate individual inner hollows for individual connection.

4,275,537

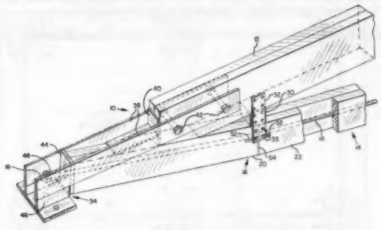
TENSION MEMBERS

Neal I. Pinson, Beaverton, Oreg., assignor to Tension Structures, Inc., El Cajon, Calif.

Continuation of Ser. No. 800,622, May 26, 1977, abandoned. This application Nov. 16, 1978, Ser. No. 961,268

Int. Cl.³ E04C *3/10*

U.S. Cl. 52—223 R **9 Claims**



1. In an improved composite tension member,

a plurality of end-to-end segments having a longitudinal center of gravity, each segment including a pair of wood beams fastened together in face-to-face engagement, said segments comprising an elongated compression portion, said segments meeting at included angles to each other of less than 180°, said segments providing a longitudinal passageway extending therethrough;

elongated tension means disposed in said passageway, said tension means paralleling and being symmetrical relative to said longitudinal center of gravity and engaging the ends of said compression portion,

said tension means being normally under a preloading predetermined tension in sufficient magnitude to press against the ends of said compression portion to place and maintain said compression portion under compressive stress throughout the application of all contemplated external tension loading conditions on said tension member, thereby causing both said tension means and said compression portion to cooperate in resisting lengthening of the assembly rather than said tension means alone, thus lessening such elongation,

said tension means including a pair of abutment members engaging the extreme outer ends of said compression portion, said tension means also including anchoring devices abutting said abutment members;

and at least one connecting means engaging the tension means and the end portions of the compression segments to prevent crushing of the compression portion by the tension means.

4,275,538

BUILDING FOUNDATION METHOD AND SYSTEM, WITH ENERGY CONSERVATION AND SOLAR ENERGY UTILIZATION FEATURES

Edward G. Bounds, 1209 Frederick Ave., Salisbury, Md. 21801

Filed Jan. 22, 1980, Ser. No. 114,355

Int. Cl.³ E02D *24/42*

U.S. Cl. 52—299 **43 Claims**

1. A method for constructing a foundation upon which a building can be erected, said method including the steps of:

excavating a plurality of spaced footing pits in the earth on the site where the building is to be erected, said pits each including a bottom and side walls;

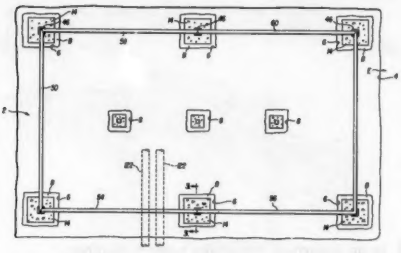
placing a preformed footing into each of said footing pits so that the footing rests on the earthen bottom wall of its associated pit, each of said footings having a grout inlet opening extending generally vertically therethrough;

connecting a source of grout under pressure to the grout inlet opening of each of said footings, and injecting grout under pressure into the region beneath each footing until the grout fills essentially all of the space between the

footing and the earthen bottom of the associated footing pit and elevation of the footing begins, so that the footing is firmly seated;

disconnecting the source of pressurized grout from each footing after it is firmly seated and before significant elevation of the footing occurs, and allowing the grout to set;

mounting a base plate means on each footing, and adjusting



the top surfaces of all the base plate means after their respective footings are firmly seated, to place said surfaces in a predetermined vertical relationship to each other; and

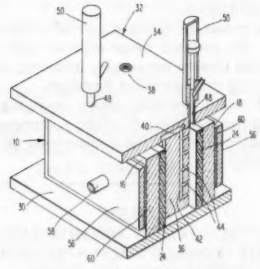
mounting horizontally extending preformed beams on the top surfaces of said base plate means, said beams extending horizontally between said base plate means and being adapted to receive and support the building to be erected on the site.

4,275,539

METHOD AND APPARATUS FOR INSULATING BUILDING BLOCKS AND THE BLOCKS PRODUCED THEREBY

Richard V. Abbott, III, 1200 E. Main St., Millville, N.J. 08332

Filed Dec. 10, 1979, Ser. No. 101,633
Int. Cl.[3] **B29D** *27/00*
U.S. Cl. 52—309.11 **11 Claims**



1. A method of forming a molded insulating layer from expandable thermoplastic polymer particles on interior surfaces of an internal cavity of a concrete masonry block; said method including the steps of:

positioning a male plug member within the internal cavity of the masonry block with at least one peripheral wall of the plug member spaced from at least one interior surface of the cavity to form a peripheral compartment;

directing the polymer particles into the peripheral compartment;

injecting steam under pressure into the peripheral compartment to cause the particles to expand and fuse together into substantially self-sustaining insulating layers in close conformity with each interior surface of the peripheral compartment, and while injecting steam under pressure into the peripheral compartment;

applying a counteracting inwardly directed external force, of a sufficient magnitude to prevent the block from cracking, to exterior surfaces of at least two opposed walls of the block, an insulating layer being expanded into close conformity with the interior surface at least one of said opposed walls;

terminating the steam injecting step;

removing the male plug member from within the internal cavity of the block; and

removing the external force applied to the opposed exterior surfaces of the block.

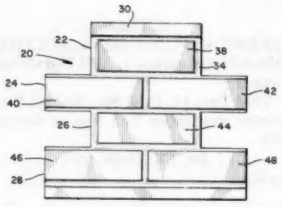
8. A concrete masonry block including a fused insulating layer of polymer particles molded to interior surfaces of an internal cavity thereof in accordance with the method of claim 1.

4,275,540

PLASTIC FREE STANDING BRICK WALL SECTION

William A. Keller, St. Louis, Mo., assignor to Keller Manufacturing Co., Inc., St. Louis, Mo.

Filed Feb. 21, 1979, Ser. No. 13,317
Int. Cl.[3] **E04C** *1/10;* **E04D** *19/00*
U.S. Cl. 52—314 **4 Claims**



1. A free standing modular simulated plastic brick section for mounting upon the ground or other base, said section comprising a rigid front wall having a plurality of vertically spaced tiers of brick facing members separated by mortar borders, said tiers being staggered vertically from adjacent tiers one-half brick, said section being integral and having top and bottom walls extending to the rear a distance at least about one-half brick, said bottom wall acting as a ground support, said section having end walls at opposite ends of the section extending to the rear to provide a rigid box-like structure open to the rear and means for joining adjacent sections in interlocking relation, vertically aligned openings being provided in said end walls at the opposite ends of each section which align vertically with an adjacent section and said joining means comprising pin means extending through said opening to join said adjacent sections and adapted to be driven into the ground, each section being comprised of an even number of tiers and adjacent sections being joined together in interlocking and abutting relations by said pin means, the individual sections being inverted with respect to one another.

4,275,541

FIRE RESISTANT FLOOR AND CEILING ASSEMBLY

David L. Orals, Arlington Heights, Ill., and Peter S. Bushey, Sharon, Wis., assignors to United States Gypsum Company, Chicago, Ill.

Filed Jan. 4, 1980, Ser. No. 109,709
Int. Cl.[3] **E04B** *5/52*
U.S. Cl. 52—483 **17 Claims**

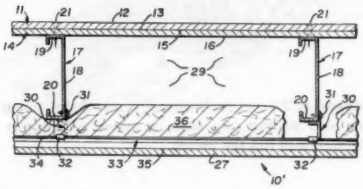
1. A fire resistant floor and ceiling assembly comprising in combination:

a plywood layer;

a gypsum floor underlayment extending adjacent below said plywood layer;

a series of steel joists located below said underlayment and supporting the plywood and underlayment;

a spaced-apart multiplicity of self-drilling self-tapping screws extending downwardly through the plywood and underlayment and engaging said steel joists thereby attaching the plywood and underlayment to the steel joists, said screws having upper threads and lower threads with an interrupting non-threaded mid-portion therebetween, the non-threaded mid-portion extending a distance substantially the same as the thickness of said plywood layer; and



at least one layer of third generation fire resistant gypsum board connected to, and supported below, said steel joists by connecting means;

whereby said assembly contains no combustibles in the plenum between said underlayment and fire resistant gypsum board; and, whereby said assembly attains at least one hour fire rating when exposed to a fire below said assembly.

4,275,542

WELDED STRUCTURE OF A POWER ARM

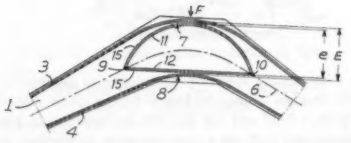
Christian D. Moro, Saint Pathus, and Daniel G. Ranini, Varreddes, both of France, assignors to Poclain, France

Filed Dec. 10, 1979, Ser. No. 101,538

Claims priority, application France, Dec. 29, 1978, 78 36908

Int. Cl.³ E04C *3/32*

U.S. Cl. 52—731 **4 Claims**



1. In a welded structure of a power arm, such as the boom of a hydraulically operated shovel, constituted by:

two lateral plates each being substantially flat, oblong, whilst its longitudinal axis, neutral in flexion in its plane, presents an elbow between its ends, and the two lateral plates have substantially identical shapes and are disposed opposite each other, substantially in parallel,

an upper plate and a lower plate which extend in the zone of the upper and lower edges respectively of the said two lateral plates on either side of said neutral axis of each of these lateral plates, and which are welded to said lateral plates, and

a box which comprises an upper cap and a lower base, forming a cross piece, is disposed between the lateral plates in the zone of said elbow of their neutral axes, said cap and base being located at least partly above and below the neutral axes, respectively, and said box is welded to said lateral plates, the cap and base join, forming two angles, along two lines which pass substantially through said neutral axis of each lateral plate.

4,275,543

AUTOMATIC MACHINE FOR CLOSING THE LOWER FLAPS OF A PARALLELEPIPED BOX WITH FOLDABLE FLAPS, AND FOR RETAINING THE BOX IN A FILLING POSITION

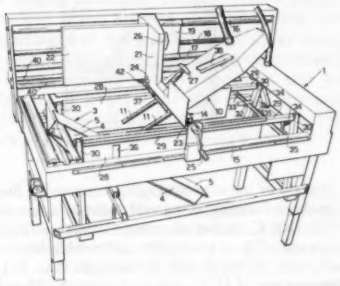
Augusto Marchetti, Piazza Sicilia 7, Milan, Italy

Filed Dec. 5, 1979, Ser. No. 100,753

Claims priority, application Italy, May 23, 1979, 22922 A/79

Int. Cl.³ B31B *5/26, 1/52*

U.S. Cl. 53—374 **6 Claims**



1. An automatic machine for closing the lower flaps of a parallelepiped box with foldable flaps, and for then retaining the box in a suitable filling position, comprising a T section with a vertical lower branch, which can be rotated from a rest position in which said upper branch is inclined downwards, to a working position in which said upper branch extends horizontally, a pair of parallel bars disposed in front of said section at a distance apart such as not to hinder the rotation of the section and which themselves can be axially displaced from a rest position in which said bars extend obliquely from a support structure converging towards said section, to a working position in which said bars are withdrawn towards said spport structure, a pair of lateral plates rotatable from a rest position in which said plates are disposed vertically to the sides of said section and said bars, to a working position in which said plates converge horizontally towards said section so that when the section is in its working position said plates are disposed below the upper branch and to the sides of the lower branch of said section, first sensitive means which, when a box with its lower flaps open is arranged above said section and said bars such that the major sides of the box are in planes parallel to the axes of said section and said bars, responds so as to cause said section to rotate from said rest position to said working position in order to close the end flaps of the box, second sensitive means which, when the section rotates into said working position, respond so as to cause said bars to move from said rest position to said working position, and third sensitive means which, when said bars move into said working position, respond so as to cause said lateral plates to rotate from said rest position to said working position in order to close the side flaps of the box under said end flaps.

4,275,544
VACUUM PACKAGING METHOD

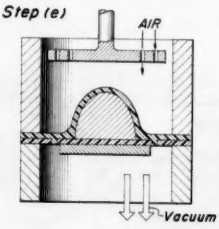
Nobuyuki Hisazumi; Masataka Yamamoto, and Tsutomu Uehara, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 936,696, Aug. 25, 1978. This application Sep. 12, 1979, Ser. No. 74,828

Claims priority, application Japan, Sep. 5, 1977, 52-105787; Netherlands, Aug. 30, 1978, 7808910; Canada, Sep. 1, 1978, 310483; Fed. Rep. of Germany, Sep. 1, 1978, 2838226; Belgium, Sep. 5, 1978, 190251; France, Sep. 5, 1978, 78 25556; Italy, Sep. 5, 1978, 27316 A/78; United Kingdom, Sep. 5, 1978, 35664/78

Int. Cl.[3] B65B *31/02, 11/52*

U.S. Cl. 53—433 14 Claims



1. A method of vacuum packaging comprising the steps of:
(a) cup-shape-forming in a metal mold at a temperature of 50° to 180° C. under vacuum, a laminate film which is composed of (1) a plastically deformable layer of a synthetic resin having a yield stress larger than 50 kg/cm^2 at a temperature of 23° C. and an elongation of less than 30% at the elastic limit at the shaping temperature and (2) an elastic layer of a synthetic resin having an elongation of more than 40% at the elastic limit at said shaping temperature;
(b) placing a base film provided with a plurality of small holes for passage of air adjacent to the metal mold;
(c) placing articles or materials to be packed at positions on said base film corresponding to the cup-shaped hollows in said laminate film;
(d) bringing the flat edge part of said cup-shape formed laminate film into contact with the edge part of said base film;
(e) evacuating the interior of the spaces formed by the cup-shape hollows of said laminate film and said base film through said holes provided in said base film; and
(f) releasing the vacuum which had been established in step (a) between said metal mold and said cup-shape formed laminate film thereby producing a tight package of said articles or materials having closely adhered laminate film, with tightly closed holes in said base film with said laminate film.

4,275,545
KELP BLADE HARVESTER

Dan R. Pace, P.O. Box 5083, Halifax, Nova Scotia, Canada (B3L 4M6)

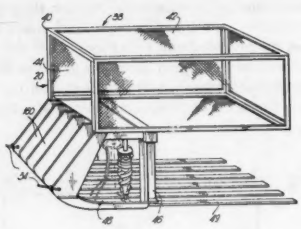
Filed Mar. 3, 1980, Ser. No. 126,692

Claims priority, application Canada, Mar. 14, 1979, 323374

Int. Cl.[3] A01D *44/00*

U.S. Cl. 56—8 41 Claims

1. A harvester mechanism comprising:
(a) a frame;
(b) a pair of helical spindles, each mounted on a shaft adjacent each other in said frame;
(c) gear means connected to said shafts for ensuring opposite rotation of one spindle relative to the other spindle;
(d) one of said shafts being mounted in said frame so that one end of said one shaft is laterally movable relative to the other shaft;
(e) cutter means mounted in said frame; and
(f) linkage means interconnecting the cutter means and said



one end of the one shaft whereby lateral movement of said one end of the one shaft actuates said cutter means through said linkage means.

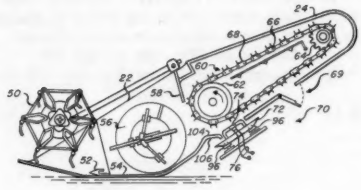
4,275,546
STONE DISCRIMINATOR

Carl E. Bohman, New Holland, Pa., and Peter G. Mitchell, Concord, Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Jan. 4, 1980, Ser. No. 109,932

Int. Cl.[3] A01D *75/18;* A01F *12/16*

U.S. Cl. 56—10.2 13 Claims

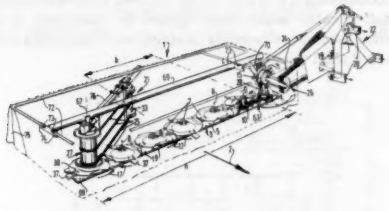


1. In a harvesting machine susceptible to damage by a non-frangible foreign object included within crop material harvested from a field and fed into the harvesting machine along a predetermined path via a crop elevator, protective apparatus for providing a signal indicative of the presence of the non-frangible foreign object at a predetermined location along the predetermined path, comprising:
at least one sensing surface for traversing the flow of crop material in said crop elevator and for receiving impactions of crop material and foreign objects;
means for mounting at least one sensing surface in operative relationship to said crop elevator and including means for vibrationally isolating said sensing surface from said combine harvester;
piezoelectric transducer means attached to at least one sensing surface for providing output signals representative of the impactions of the foreign objects and the crop material;
means coupled to said piezoelectric transducer means for selecting said foreign object impact signal from other signals coupled thereto; and
means coupled to said selection means responsive to said foreign object impact signal for generating a utilization signal useful for indicating the presence of said foreign object.

4,275,547
MOWING DEVICE

Pieter A. Oosterling, and Hendricus C. van Staveren, both of Nieuw-Vennep, Netherlands, assignors to Multinorm, B.V., Nieuw-Vennep, Netherlands

Filed Jun. 18, 1979, Ser. No. 49,598
Claims priority, application Netherlands, Jun. 20, 1978, 7806654
Int. Cl.[3] A01D *55/18*
U.S. Cl. 56—13.6 36 Claims

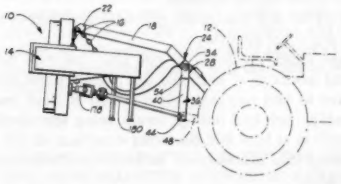


1. A mowing device comprising a girder extending transversely of the direction of movement of the mower, a plurality of cutting members rotatably journalled on said girder and arranged above the same, a cutting driving gear for the cutting members arranged on or in the girder, a carrier extending transversely of the direction of movement and at least one swath former comprising at least one driven rotor rotatable about an upwardly extending axis and journalled on the carrier, one end of the girder being connected with a suspension framework to be hitched to a vehicle, whilst each cutting member has at least one cutter fastened to its periphery and the swath former is arranged at the end of the mowing device remote from the suspension framework, characterized in that the swath former essentially comprises the said rotor arranged at one end of the mower, a reversing roller extending rearwardly away from the end of the mower and rotatably journalled on the carrier and at least one endless, flexible swath-forming member arranged between the former and in that the end of the girder remote from the suspension framework is carried by said carrier through a rotational bearing and a suspension element centrally arranged in the rotor of the swath former and engaging a cutting disc.

4,275,548
TREE SHAKER

Basil W. Savage, Sr., Madill, Okla., assignor to Savage Equipment, Inc.

Filed Jul. 16, 1979, Ser. No. 57,981
Int. Cl.[3] A01G *19/00*
U.S. Cl. 56—328 TS 1 Claim



1. In a plant shaking apparatus of the type including clamp means for gripping a plant and vibrator means for vibrating said clamp means to shake said plant, the improvement wherein said vibrator means comprises:

first and second eccentric weight means mounted to rotate in opposite directions in substantially the same first substantially vertical plane about axes of rotation substantially normal to said first plane, said axes of rotation of said first and second weight means being spaced and parallel to each other and lying in a second substantially vertical plane, said second plane being substantially perpendicular to said first plane; and

a drive means for rotating first and second weight means, said drive means and first and second weight means being so co-ordinated that when said first weight means is at its lowest position said second weight means is at its highest position, and when said first weight means is at its highest position said second weight means is at its lowest position, so that a varying substantially vertical force generated by said first weight means is continuously substantially equal and opposite to a varying substantially vertical force generated by said second weight means;

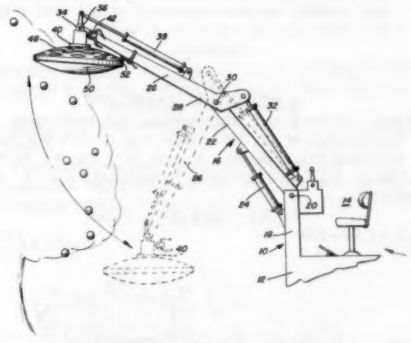
wherein said first weight means includes a first plurality of weights detachably mounted upon a first shaft so that centers of gravity of said weights of said first plurality of weights are spaced parallel to said axis of rotation of said first weight means; and

wherein said second weight means includes a second plurality of weights detachably mounted upon a second shaft, said weights of said first and second pluralities of weights being arranged so that selected weights may be removed from each of said first and second pluralities of weights to reduce the vibrating force produced by said first and second weight means while maintaining the same first substantially vertical plane of rotation of the centers of gravity of said first and second weight means.

4,275,549
FRUIT HARVESTER

Carl P. Deal, Jr., 1906 Chieftan, Dade City, Fla. 33525

Filed Mar. 24, 1980, Ser. No. 133,299
Int. Cl.[3] A01D *46/24*
U.S. Cl. 56—328 R 8 Claims



1. A rotary fruit harvester including a mount, a rotary head journaled from said mount, said head including a hollow body having peripheral wall surfaces extending along circular paths concentric with the axis of rotation of said head, said surfaces including spaced fruit receiving openings therein, said peripheral wall surfaces comprising outer surface areas of generally partial spherical wall portion of said head substantially concentric with the axis of rotation of said head.

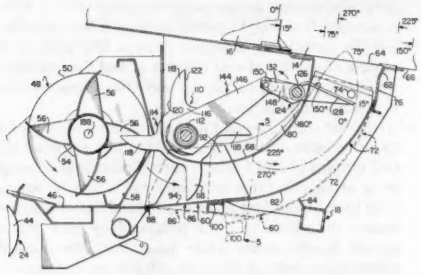
4,275,550
CROP BALER

Edward L. Swenson, and Howard L. Ratzlaff, both of Hesston, Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Oct. 15, 1979, Ser. No. 84,583
Int. Cl.[3] B30B *9/30*; A01D *39/00*
U.S. Cl. 56—341 9 Claims

1. A crop baler including:

an elongated bale forming chamber having a laterally disposed opening therein;
compacting mechanism including a plunger continuously reciprocable within said chamber longitudinally thereof across said opening to open and close the latter;
an elongated, tubular duct projecting laterally outwardly from said chamber in registration with said opening;
means positioned at a mouth at the outer end of said duct for continuously feeding crop material into the duct to accumulate a charge thereof;
a loader associated with said duct for stuffing successively



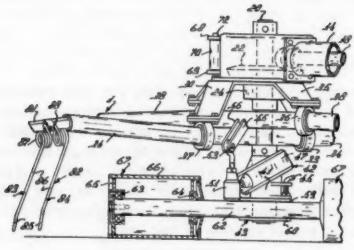
accumulating charges from the duct into said chamber in timed relationship to reciprocation of said plunger, and at regular intervals,
said duct being transversely expandable from a minimum volume position toward a maximum volume position; and
control means for preventing said expansion of the duct unless the density of a charge of material accumulating in said duct reaches a certain predetermined level,
said duct having a wall thereof extending along the path of travel of material from the feeding means into the duct and yieldably shiftable transversly of said path of travel for permitting said expansion of the duct.

4,275,551

HAYMAKING MACHINES

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Continuation of Ser. No. 786,029, Apr. 8, 1977, Pat. No. 4,157,644. This application Apr. 26, 1979, Ser. No. 33,752
Claims priority, application Netherlands, Apr. 8, 1976, 7603683
Int. Cl.³ A01D *78/10, 80/00*
U.S. Cl. 56—370 **1 Claim**



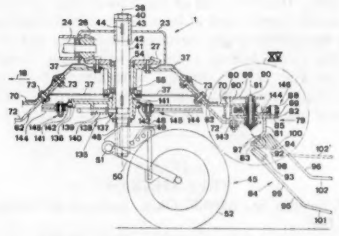
1. A hayraking machine including a frame and at least one rotatable rake member supported on said frame, said rake member being rotatable about an axis defined by an upwardly extending shaft mounted on said frame, at least one freely rotatable supporting member connected to the lower portion of said shaft, said supporting member having a ground engaging surface which substantially defines a cylinder having a length greater than its diameter, said cylinder being disposed laterally relative to a vertical plane extending in the intended direction of travel of the machine through said axis, a laterally extending shaft member being mounted on said lower portion, said supporting member being rotatably mounted on said shaft member, bearings being provided in said supporting member, said supporting member being releaseably retained in rotary connection with said shaft member by a locking means provided on said shaft member, said locking means being removably mounted on said shaft member whereby said supporting member is removable from said shaft member, said locking means comprising a bolt and shield received at the outer end of said shaft member which bears against the outer end of said supporting member releaseably retaining said supporting member on said shaft member.

4,275,552

HAYMAKING MACHINE

Frans J. G. C. DeCoene, Zedelgem, Belgium, assignor to Sperry Corporation, New Holland, Pa.

Filed Dec. 31, 1979, Ser. No. 108,322
Claims priority, application United Kingdom, Jan. 9, 1979, 00747/79; Jun. 5, 1979, 19517/79
Int. Cl.³ A01D *78/12, 57/12*
U.S. Cl. 56—370 **29 Claims**



1. A haymaking machine comprising:
a frame adapted for movement across a field;
at least one rotor assembly rotatably supported by said frame about a first axis of rotation;
a plurality of tine assemblies pivotally attached to said at least one rotor assembly;
a linkage means mounted at one end coaxially with the pivotal mounting of each said tine assembly and pivotable relative to said tine assembly and said at least one rotor assembly, each said linkage means being selectively connectable in at least one operating condition to said corresponding tine assembly so as to be movable in unison therewith;
an actuation means mounted on said at least one rotor assembly;
a connecting means interconnecting said actuation means and each said linkage means, such that, in said at least one operating condition, said actuation means is operable to alternatively move said corresponding tine assembly between an extended crop engaging position and a retracted crop releasing position; and
drive means for rotating said at least one rotor assembly.

4,275,553

PROCESS AND APPARATUS FOR SERVICING A NUMBER OF MUTUALLY ADJACENT SPINNING POSITIONS OF AN OPEN-END SPINNING MACHINE

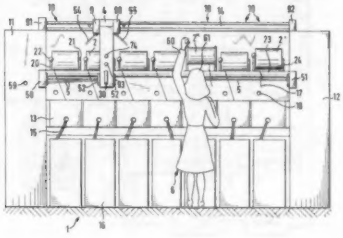
Reinhard Blohm, Buchholz; Rupert Karl, Ingolstadt, and Hans Sarcander, Kosching, all of Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed May 17, 1979, Ser. No. 15,899

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1978, 2809001

Int. Cl.³ D01H *15/00, 15/02*

U.S. Cl. 57—263 **20 Claims**



1. A method for servicing a number of mutually adjacent spinning positions of an open-end spinning machine by means of a servicing apparatus which is movable along said spinning positions, each of said spinning stations having a bobbin carried thereon upon which yarn is being wound, said method comprising the following steps:

an operator while preparing to service a spinning position that is to be serviced triggering a circuit for initiating the movement of said service apparatus from its existing location to adjacent said spinning position to be serviced;

maintaining said service apparatus adjacent said spinning position until said operator concludes the preparatory work;

bringing said service apparatus from said position adjacent said spinning position into the exact working position for the initiation and carrying out of the servicing; and

setting said service apparatus into operation.

3. An apparatus for servicing a number of mutually adjacent spinning positions of an open-end spinning machine by means of a servicing apparatus which can move along said spinning positions, said apparatus comprising:

a travel drive means (**40**) for said servicing apparatus (**3**) for driving said servicing apparatus along said spinning machine when activated;

switch means (**5, 56, 560**) connected to said travel drive means (**40**) for activating said travel drive means responsive to being actuated by an operator at a spinning station requiring serive, and switch means connected to said travel drive means (**40**) for de-activating said travel drive means for halting the movement of said servicing apparatus in the neighborhood of said operator at said spinning station requiring service.

4,275,554

CLEARANCE-PRODUCING MEANS FOR OPEN-END SPINNING MACHINE SERVICING APPARATUS

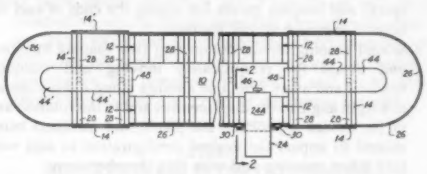
Philip B. Tarbon, Pendleton, and Charles R. Martin, Seneca, both of S.C., assignors to Platt Saco Lowell Limited, Helmshore, England

Filed Dec. 5, 1979, Ser. No. 100,608

Int. Cl.³ D01H *15/02, 1/12*

U.S. Cl. 57—263 **6 Claims**

1. In combination, an elongate open-end spinning machine having a plurality of spinning stations spaced along its length and having a cabinet structure at one thereof; an upstanding mobile servicing apparatus, having upper and lower portions respectively disposed above and below the top elevation of said spinning machine, adapted to move about said spinning machine along a path of travel having a first section adjacent said spinning stations of said spinning machine and having a second section adjacent said cabinet structure of said spinning machine; mounting means, extending in vertically spaced overlying relationship to the periphery of said spinning machine, mounting said apparatus for said movement thereof along its said path of travel, and for pivotal movement of said apparatus transversely of its said path of travel; said apparatus normally occupying a pivotal position wherein said apparatus is movable freely along said first section of its said path of travel and wherein movement thereof along said second section of its



path of travel is obstructed by lateral interference between said lower portion of said apparatus and said cabinet structure of said machine; cam means, disposed at an elevation above said spinning machine and operatively association with said upper portion of said apparatus for, during movement of said apparatus from said first and to said second section of its said path of travel, pivoting said apparatus in a direction displacing said lower portion thereof laterally outwardly from said cabinet structure of said machine sufficiently for said lower portion of said apparatus to clear said cabinet structure and for said apparatus to move freely along said second section of its said path of travel.

4,275,555

MACHINE AND A METHOD FOR CONSTRUCTING A CHAIN HAVING AUTOMATICALLY SHAPED AND WELDED CHAIN LINKS

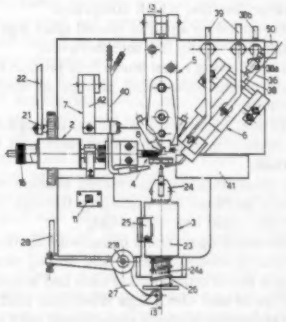
Pasquale Bichi, Arezzo, Italy, assignor to Gori & Zucchi S.p.A., Italy

Continuation-in-part of Ser. No. 822,800, Aug. 8, 1977, abandoned. This application May 22, 1979, Ser. No. 41,530

Claims priority, application Italy, Aug. 20, 1976, 50977 A/76

Int. Cl.³ B21L *3/02*

U.S. Cl. 59—3 **8 Claims**



1. A machine for constructing a chain of metallic shaped links comprising:

a device for feeding a wire to be used to form each chain link;

a first shaping device to wind said wire so as to form a

cylindrical wire spiral of predetermined radius and pitch or of other suitable similar form;

a pliers carrying device having gripping members and supported in such a way to perform rectilinear strokes to and from the zone in which the free end of the wire spiral extends, and associated with said first shaping device, with means for axially rotating said pliers carrying device, and with means for opening and closing the gripping members of the pliers so as to grip the first free spiral turn;

a cutting device supported by means for moving said cutting device to and from the zone in which the free end of the wire spiral extends, said cutting device including cutting means for separating the first spiral turn from the said wire spiral, and shaping means for urging the ends of said cut turn to approach to one another;

a second shaping device comprising two shaping members and means for reciprocately moving said members towards and away from one another along a direction set at a right angle to the displacement and to the rotation axis of the device supporting the pliers, said members being shaped to impart the desired configuration to said wire turn when pressing said wire turn therebetween;

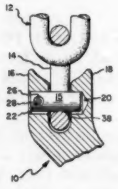
a welding unit to weld the ends of the chain link; and control means for moving the above described devices and means composing the machine into and retracting from said operative positions in a predetermined time sequence and at desired times.

4,275,556

CLEVIS TYPE CONNECTION DEVICE

Franz T. Stone, East Aurora, and Kenneth D. Schreyer, Clarence, both of N.Y., assignors to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed May 25, 1979, Ser. No. 42,508
Int. Cl.³ F16G *15/00*
U.S. Cl. 59—93 **13 Claims**



1. A clevis type connection device for load chains of the loop link type or the like, which comprises:

a clevis body including a pair of spaced apart legs for receiving a chain link or the like therebetween;

one of said legs having a first bored hole portion fully closed by sealing means obstructing passage of foreign matter therethrough;

the other of said legs having a second through-bored hole portion thereof in axial alignment with said first bored hole portion;

a load pin accommodated in cradled relation within said bored hole portions for extending through the central opening of a chain link or the like,

said load pin being operational in endwise abutting engagement at one of its ends against said sealing means and of such length that it is disposed at each end within the outer end profiles of said clevis legs when said load pin is disposed to proximate abutting engagement with said sealing means; and

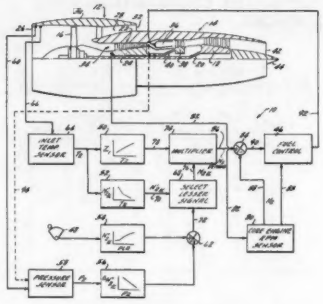
retaining means intercepting the bore of the other of said legs and adapted to engage said load pin, whereby to constrain said load pin against unintended displacements thereof away from engagement with the central opening of said chain link or the like.

4,275,557

METHOD AND APPARATUS FOR CONTROLLING THRUST IN A GAS TURBINE ENGINE

Ira E. Marvin, Fairfield, and Joseph R. Cowgill, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jan. 25, 1978, Ser. No. 872,125
Int. Cl.³ F02C *9/08*
U.S. Cl. 60—39.03 **12 Claims**



1. Apparatus for controlling thrust of a gas turbine engine of the type having a compressor, a combustor and a turbine with means for producing signals proportional to engine inlet temperature, engine inlet pressure and comproessor physical rotational speed, a fuel controller, and a power lever adapted to be set to different angles to select a different desired engine thrust at each power lever angle, wherein the improvement comprises means for providing a demand compressor physical speed signal adjusted by engine inlet pressure and temperature wherein said means for providing a demand compressor physical speed signal comprises means for producing a first demand compressor corrected speed signal as a function of the selected power lever angle, said last recited signal being further proportional to compressor physical speed divided by θ^n, wherein n is that exponent which provides flat-rated thrust independent of engine inlet temperature for those inlet temperatures which are below a preselected flat-rating inlet temperature, means for comparing said compressor physical speed signal and said demand compressor physical speed signal to develop an error signal, said error signal being coupled to said fuel controller in order to maintain said desired thrust at each selected power lever angle.

4,275,558

GAS TURBINE ENGINE FUEL GOVERNOR

Robert A. Hatch, Boca Raton, Fla.; Harvey B. Jansen, Tempe, Ariz.; Frederic E. Bolliger, and Robert B. Sumegi, both of Phoenix, Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 22, 1977, Ser. No. 863,495
Int. Cl.³ F02C *9/04*
U.S. Cl. 60—39.16 R **45 Claims**

1. A gas turbine engine fuel control system comprising:

a housing having an inlet for receiving pressurized fuel flow and an outlet for delivering fuel flow to the engine;

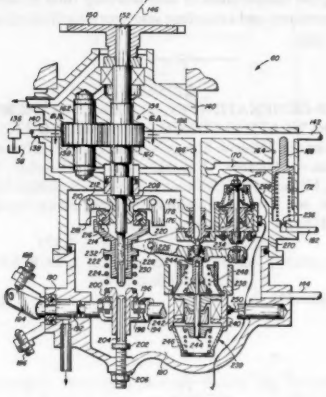
means defining a variable orifice in said housing for variably metering fuel flow to said outlet, including an adjustable element for varying the size of said orifice;

means for continuously sensing a preselected parameter of engine operation and exerting a first force on said element in relation to the value of said sensed parameter;

throttle means for continuously exerting a variable second force on said element opposing said first force, said second force being indicative of a desired valve for said preselected parameter;

an electronic control developing a first electrical signal upon occurrence of a preselected condition of engine operation;

a first electromechanical transducer operable when energized by said first electrical signal for selectively exerting a third force on said element opposing said second force



upon occurrence of said preselected condition of engine operation; and

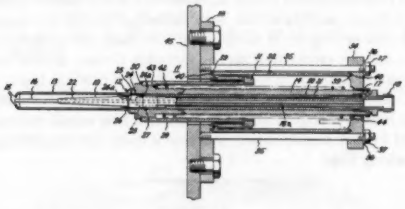
means for selectively exerting a fourth force on said element upon occurrence of another preselected condition of engine operation, said element operable to mechanically sum said first through fourth forces.

4,275,559

RETRACTABLE IGNITER DEVICE FOR GAS TURBINES

Lynn J. Blair, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 31, 1979, Ser. No. 71,780
Int. Cl.³ F02C *7/266*; H01T *13/14*
U.S. Cl. 60—39.82 S **1 Claim**



1. An improved retractable igniter capable of igniting a combustible mixture in a combustor of a gas turbine comprising:

a piston assembly including a unitary conductive tubular shell with a cylindrical spark electrode section having an integral cylindrical body section, said electrode section being of reduced diameter and having a thinner wall section than said body section and said body section having an open breech end;

said body section including a core assembly comprising a tubular insulator coaxial with the internal walls of said body section and surrounding a central electrode extending from said spark electrode section to said breech end of said body section;

said piston assembly further including an outer conductive tubular sleeve coaxial with said body section, said sleeve having one end abutting a shoulder located at a predetermined position on the outer surface of said body section, the other end of said sleeve extending toward said breech end and forming a circumferential slot between said sleeve and said body section;

a helical spring coaxial with said body section and having one end abutting a shoulder within said circumferential slot and the other end resting against a shoulder in a base flange adjacent said breech end; and

means for retractably supporting said piston assembly, said means including a protective cylinder held in fixed position between a mounting flange through which said piston assembly retractably extends and said base flange and a cylindrical ring attached to the other end of said outer conductive tubular sleeve;

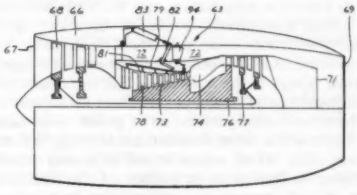
said spark electrode section and a portion of said outer conductive tubular sleeve extending through said mounting flange when said piston assembly is fully extended and retracted into said protective cylinder when said spring is compressed, the compressed height of said spring being insufficient to limit the stroke of said piston assembly.

4,275,560

BLOCKER DOOR ACTUATION SYSTEM

Jack D. Wright, Mason, and Barton H. Snow, Wyoming, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 27, 1978, Ser. No. 973,765
Int. Cl.³ F02K *3/02*; F01B *25/02*
U.S. Cl. 60—226 B **6 Claims**



1. An improved turbofan engine of the type having a core with variable stators, a fan, a duct for bypassing a portion of the fan flow around the core, and a plurality of blocker doors in the duct for selectively blocking the flow of air in the duct, wherein the improvement comprises:

(a) stator actuator means for selectively varying the angle of the variable stator vanes in response to a predetermined engine parameter, said stator actuator means including at least one linear actuator located radially outside of said duct and at least one rotatable shaft passing through said duct and linked to said linear actuator for transmitting movement therefrom;

(b) blocker door actuator means for selectively varying the angle of the blocking doors as a function of the variable stator vane angle, said blocker door actuator means including an actuator ring and a plurality of lever arms attached at their one end to said actuator ring and at their other ends to the blocker doors;

(c) linkage means interconnecting said stator actuation means and said blocker door actuator means such that when the angle of the variable stator vanes is varied within a first predetermined range, the angle of the blocker doors is varied within a second predetermined range, said linkage means including a cam element which is rotated by said stator actuator means and a cam follower with an attached bellcrank which is rotated during rotation of said cam through a predetermined angle range, said linkage means including a drag link connecting said bellcrank to said actuator ring for transmitting rotation movement by said cam element with said drag link being connected to said bellcrank and to said actuator ring through

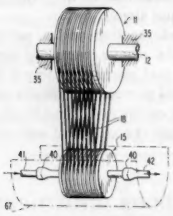
a pair of uniball connections for accommodating axial movement.

4,275,561

ENERGY CONVERSION SYSTEM

Frederick E. Wang, 11816 Caplinger Rd., Silver Spring, Md. 20904

Filed Aug. 3, 1978, Ser. No. 930,701
Int. Cl.³ F03G 7/06
U.S. Cl. 60—527 **38 Claims**



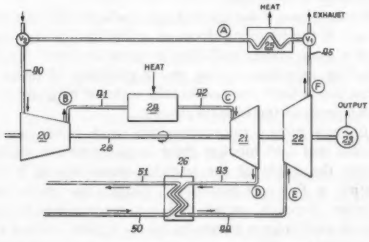
1. A device for converting thermal energy into mechanical energy, comprising at least two rotatably supported wheel means, and endless transmission means of a material having a memory effect capable in the bending mode of converting thermal energy into mechanical energy when heated from a temperature below its transition temperature to a temperature above its transition temperature, said transmission means having a normal substantially rectilinear shape and operatively connecting with each other said wheel means to drive one of said wheel means by the other wheel means upon application of thermal energy to the transmission means, characterized in that the transmission means is bent from its normal substantially rectilinear configuration as it passes over said other wheel means and at the same time thermal energy is transferred from said other wheel means to said deformed transmission means over at least a major portion of the circumferential contact of said transmission means with said other wheel means to thereby cause said transmission means to revert to its normal substantially rectilinear shape.

4,275,562

COMPOSITE ENERGY PRODUCING GAS TURBINE

Andrew A. Fejer, Oak Park, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

Filed Aug. 6, 1979, Ser. No. 64,113
Int. Cl.³ F01K 25/00; F02C 1/10, 6/04
U.S. Cl. 60—648 **13 Claims**



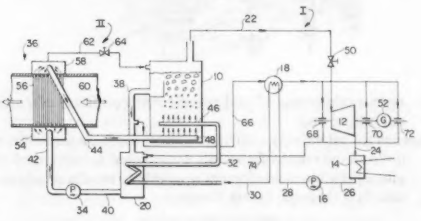
1. A process for providing shaft power and process heat by use of a composite energy producing gas turbine system the steps comprising in sequence; compressing a turbine working fluid, further heating said working fluid to temperature for introduction to a high temperature turbine, partially expanding said working fluid through a high temperature turbine providing shaft power output from said system, passing said working fluid in heat exchange relation with a lower temperature process fluid providing heat output from said system, further expanding said working fluid through a low temperature turbine providing additional shaft power output from said system, adjusting the temperature of said working fluid to about ambient temperature, and recycling said working fluid to said compressing step.

4,275,563

POWER-GENERATING PLANT HAVING INCREASED CIRCULATING FORCE OF WORKING FLUID

Michio Kuroda, Hitachi; Shozo Nakamura, Hitachiouta; Satoshi Tsukahara, Hitachi; Yasuaki Akatu, Hitachi; Shigehisa Sugita, Hitachi; Kojiro Kaneko, Hitachi; Seiichiro Sakaguchi, Hitachi, and Ryoichiro Oshima, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 18, 1979, Ser. No. 4,577
Claims priority, application Japan, Feb. 3, 1978, 53-10502
Int. Cl.³ F01K 25/06
U.S. Cl. 60—673 **16 Claims**



1. A power generating plant comprising a first circulation means for circulating a low boiling point medium in a closed cycle, a second circulation means for circulating a heat source medium in a closed cycle, heat exchanger means operatively connected with the first and second circulation means for bringing the low-boiling point medium and the heat source medium into direct contact so as to generate a working fluid, the first circulation means includes first nozzle means arranged in a lower portion of the heat exchanger means for injecting the low-boiling point medium into the heat exchanger means, the second circulation means includes further nozzle means arranged in the heat exchanger means at a position lower than the first nozzle means for injecting the heat source medium into the heat exchanger means whereby said first nozzle means and said further nozzle means increase a force for circulating the working fluid.

4,275,564

COMBUSTION CHAMBER FOR GAS TURBINE ENGINES

Guenter Kappler, Freising, and Adolf Fehler, Pfaffing, both of Fed. Rep. of Germany, assignors to Motoren- und Turbinen Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 10, 1979, Ser. No. 28,748
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1978, 2815916
Int. Cl.³ F02C 7/22
U.S. Cl. 60—738 **11 Claims**

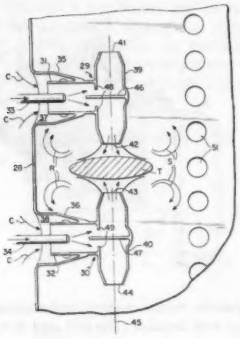
1. A gas turbine engine, comprising:

a combustion chamber including a flame tube having a back wall;

a plurality of vaporizers projecting through said back wall and into said flame tube, each said vaporizer having at least one pipe section extending within said flame tube, fuel supply and air supply ports in communication with said pipe section, and at least one outlet port for supplying

a vaporous fuel-air mixture from said pipe section to said flame tube,

wherein first and second said outlet ports of respective, adjacent first and second said vaporizers are arranged



spaced-apart from and directly facing one another, said first and second outlet ports having respective center axes which are coaligned, whereby a zone of maximum turbulence is formed between said first and second outlet ports.

4,275,565

TRANSFER DEVICE FOR A CRYOGENIC MEDIUM

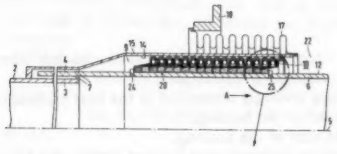
Rudolf K. Beck, deceased, late of Erlangen, Fed. Rep. of Germany (by Christa Beck, Thoms Beck, and Matthias Beck, heirs), assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 18, 1979, Ser. No. 49,324

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1978, 2829555

Int. Cl.³ F17C *7/02*

U.S. Cl. 62—55 **9 Claims**



1. In a sealing device for establishing a seal at the point of transfer of a cryogenic medium between a stationary conducting tube and a rotating conducting tube, a section of the stationary tube surrounding a secton of the rotating tube and forming therewith an annular space, in which at least one sealing element which is made of an elastic material is disposed, the improvement comprising:

said sealing element being fastened to the outside of said section of the rotating tube so that it extends essentially radially relative to the axis of rotation, and

said sealing element made of a material which is sufficiently elastic to permit its radial dimension to increase by a predetermined amount when the section of tube to which it is connected rotates.

4,275,566

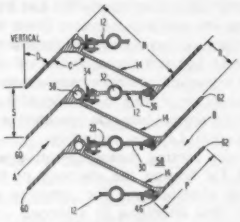
CRYOPUMP APPARATUS

John W. Bonn, Norwich Township; Franklin County, Ohio, assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 1, 1980, Ser. No. 136,194

Int. Cl.³ B01D *8/00*

U.S. Cl. 62—55.5 **12 Claims**



1. In cryopump apparatus including:

(a) means for supplying cryogenic fluid;

(b) means for supplying refrigerant fluid;

(c) a panel including:

(i) heat exchange surfaces on respective opposite sides thereof; and

(ii) first conduit means for conducting said cryogenic fluid therethrough in heat transfer relationship with said heat exchange surfaces;

(d) means delivering said cryogenic fluid to said panel conduit for flow through said conduit in heat exchange relationship with said panel heat exchange surfaces;

the improvement comprising:

(e) a passageway, of zigzag configuration, containing said panel, and including a conduit for conducting said refrigerant fluid therethrough in heat transfer relationship with wall structure of said conduit;

wherein mutually facing surfaces of said passageway and said panel are in spaced relationship;

wherein said passageway has openings at opposite ends thereof for flow of gas therethrough to respective heat exchange surfaces of said panel; wherein said wall structure is positioned between said panel and said openings for shielding said panel.

4,275,567

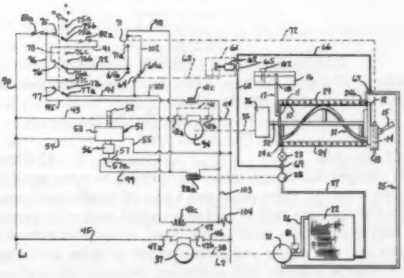
METHOD AND APPARATUS FOR CONTROLLING OPERATION OF A SOFT-SERVE MACHINE

Stephen W. Schwitters, Rockford, Ill., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Mar. 31, 1980, Ser. No. 135,492

Int. Cl.³ A23G *9/00*

U.S. Cl. 62—63 **18 Claims**



12. A control system for controlling operation of a semi-frozen commestible dispensing machine of the type which

includes a freezing chamber having a product ingredient inlet and a product outlet, dispensing valve means selectively operable to intermittently dispense product through the product outlet, a rotary dasher in the freezing chamber and a dasher drive motor connected to the dasher, an evaporator in heat conducting relation with the freezing chamber having a refrigerant inlet and a refrigerant outlet, refrigeration producer means including a compressor and a condensor and having a high pressure refrigerant supply line and a low pressure refrigerant return line and a compressor drive motor connected to the compressor, means connecting the low pressure refrigerant return line to the refrigerant outlet of the evaporator and refrigerant expansion control means connecting the high pressure refrigerant supply line to the inlet of the evaporator operative to control normal low side operating pressure in the evaporator, the control system including:

(a) viscosity sensing means operative when the dasher is driven for sensing the viscosity of the product in the freezing chamber and for actuating a viscosity switch from a first condition to a second condition when the viscosity of the product increases to the desired product consistency;

(b) refrigerant pressure sensing means operative when the pressure applied thereto rises to a preselected pressure above normal low side operating pressure for moving a pressure switch means from a first condition to a second condition and for moving the pressure switch means from the second condition back to its first condition only when the pressure applied thereto drops to a pressure below normal low side operating pressure;

(c) dispensing valve sensing means for sensing when the dispensing valve is opened and for operating a dispensing switch from a first condition to a second condition when the dispensing valve is open;

(d) a refrigerant control valve in the high pressure refrigerant supply line ahead of the refrigerant expansion control means;

(e) means operatively connecting the pressure sensing means to the evaporator to sense the refrigerant pressure in the evaporator when the supply of refrigerant to the evaporator is shut off;

(f) means controlled by the pressure switch means for energizing the compressor drive motor when the pressure switch is in its first condition;

(g) means controlled by the viscosity switch means for actuating the refrigerant control valve to its open condition when the viscosity switch means is in its first condition and for actuating the refrigerant control valve to its closed position when the viscosity switch means is in its second condition;

(h) means controlled by said dispensing switch means for actuating the refrigerant control valve to its open condition and for energizing the compressor drive motor when the dispensing switch is in its second condition;

(i) and means for energizing the dasher drive motor when the compressor drive motor is energized.

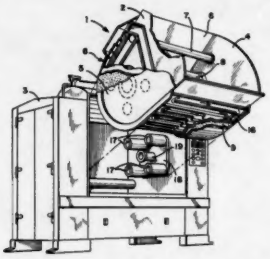
4,275,568

REFRIGERATED DOUGH MIXER

Franklin J. Zielsdorf, Sidney, Ohio, assignor to Peerless Machinery Corporation, Shelby, Ohio

Filed Aug. 30, 1979, Ser. No. 70,754
Int. Cl.³ A23G *9/00*
U.S. Cl. 62—342 **12 Claims**

8. A refrigerated dough mixer comprising an open top bowl including a curved sheet panel and a pair of parallel end panels disposed at opposite ends of said sheet panel, means for providing a supply of cooling fluid to said bowl, an agitator extending between said end panels and journaled for rotation within said bowl, a hollow breaker tube extending between said end panels, a hollow dough retarding tube extending between said end panels, means within said sheet panel defining a series of side-by-side flow channels which extend between said end panels and which are interconnected for circulating said cooling fluid and cooperatively cooling substantially the entire interior surface of said sheet panel, means defining fluid flow channels within said end panels for circulating said cooling fluid and cooperatively cooling substantially the entire interior surface



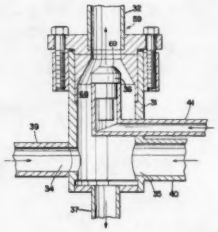
of said end panels, means causing said cooling fluid to be circulated through said breaker tube and said dough retarding tube, temperature sensing means for sensing the temperature within said bowl, and control means responsive to said temperature sensing means for controlling the flow of said cooling fluid.

4,275,569

INTERNAL COOLING OF HEAT EXCHANGER TUBES

Richard R. Mayers, Delta; Steven R. Huebner, and Dennis A. Chojnacki, both of Toledo, all of Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Division of Ser. No. 969,116, Dec. 13, 1978, Pat. No. 4,211,088.
This application Dec. 21, 1979, Ser. No. 106,172
Int. Cl.³ F25D *17/02*
U.S. Cl. 62—373 **6 Claims**



1. An apparatus for cooling a heat exchanger tube at controlled conditions comprising:

a housing sealingly connected to the heat exchanger tube;

a gas inlet to the housing;

a liquid inlet to the housing;

a means to generate mist located within the housing and directed to spray a stream of mist into the heat exchanger tube.

4,275,570

OIL COOLING MEANS FOR REFRIGERATION SCREW COMPRESSOR

Paul G. Szymaszek, and Robert A. Hall, both of Milwaukee, Wis., assignors to Vilter Manufacturing Corporation, Milwaukee, Wis.

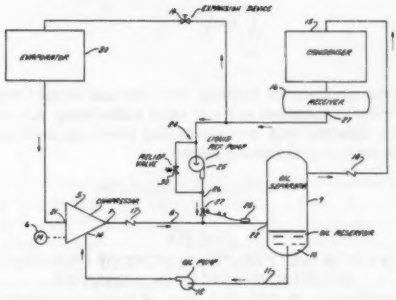
Filed Jun. 16, 1980, Ser. No. 159,502
Int. Cl.³ F25B *43/02*
U.S. Cl. 62—468 **5 Claims**

1. In a refrigeration system of the type comprising a screw compressor of controllably variable capacity which is cooled and lubricated by the circulation of oil therethrough and

which has a discharge outlet from which a mixture of compressed refrigerant and oil issues, an oil separator communicated with said discharge outlet through a discharge duct, means for circulating oil back to the screw compressor from the oil separator and a receiver to which refrigerant flows from the oil separator through a condenser and in which liquid refrigerant is held for circulation through an evaporator and thence back to the screw compressor, oil cooling means for cooling the oil discharged from the compressor before it is circulated back thereto, said oil cooling means being characterized by:

A. a liquid refrigerant pump;

B. delivery means connecting said pump in an oil cooling



bypass having an inlet at said receiver and an outlet at said discharge duct, whereby the pump can deliver to said mixture, as it flows to the oil separator, a flow of liquid refrigerant that cools said mixture;

C. sensor means for detecting a function of the percentage of its full capacity at which the screw compressor is operating and for producing an output which substantially corresponds to said detected function; and

D. said delivery means having flow metering means connected with said sensor means to receive said output therefrom and whereby the rate of flow of liquid refrigerant to said discharge duct is controlled in substantial correspondence with the rate of discharge of said mixture from the screw compressor.

4,275,571

HOMOKINETIC UNIVERSAL JOINT

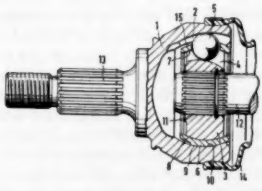
Hans-Heinrich Welschof, Rodenbach, Fed. Rep. of Germany, assignor to Lohr & Bromkamp, Offenbach am Main, Fed. Rep. of Germany

Filed Apr. 11, 1979, Ser. No. 29,078

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1978, 2816155

Int. Cl.³ F16D *3/30*

U.S. Cl. 64—21 **3 Claims**



1. A homokinetic universal joint assembly comprising: an outer joint member including a generally spherical inner surface shaped to define a hollow space open on one side thereof with grooves formed therein uniformly distributed over the circumference thereof; an inner joint member arranged in said outer joint member, said inner joint member including a generally spherical outer surface with grooves formed therein which correspond in number to the grooves in the inner surface of said outer joint member; a plurality of roller members interposed in torque-transmitting relationship between said inner joint member and said outer joint member, said grooves being arranged such that each of said roller members will be engaged between a groove of said inner joint member and a groove of said outer joint member; a cage including apertures within which said roller members are operatively supported, said cage being arranged within said hollow space radially between said inner and said outer joint members and having concentric inner and outer spherical surfaces; each pair of cooperating grooves of said inner and said outer joint member being widened in the direction of the opening of said outer joint member for controlling said roller members in the angle-bisecting plane; said cage being guided with its spherical outer surface on the spherical inner surface of said outer joint member and with its spherical inner surface on the spherical outer surface of said inner joint member; said universal joint assembly being formed as a fixed joint with said cage operatively interposed between said inner and outer joint members to prevent axial mobility therebetween; said cage having formed on its spherical outer surface on the side thereof opposite said open side of said hollow space a reduced diameter portion extending axially over part of said cage and having a maximum diametral dimension which is not greater than the minimum diametral dimension of said hollow space, said reduced diameter portion operating to facilitate assembly of said cage and said inner joint member to within said hollow space.

4,275,572

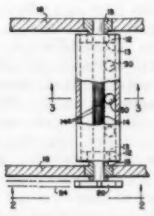
TORQUE LIMITING DRIVE SYSTEM

Phillip R. Holmes, 1125 S. LeRoy, Fenton, Mich. 48430; James A. Kehler, 11241 Fernitz, Byron, Mich. 48418, and Ronald A. Bogusky, 12364 Erica, Hartland, Mich. 48029

Continuation-in-part of Ser. No. 833,723, Sep. 16, 1977, abandoned. This application Jan. 10, 1979, Ser. No. 2,401

Int. Cl.³ F16D *7/02*; B65G *13/06*

U.S. Cl. 64—30 D **2 Claims**



1. A torque limiting drive system for driving a tubular driven member by a drive shaft, said system comprising means for supporting the drive shaft in a rotative condition;

means for imparting a rotative drive to the drive shaft;

said drive shaft having a portion of circular cross-sectional configuration contained within said tubular driven member;

said tubular driven member having a relatively smooth inner surface;

a spherical drive element mounted intermediate the inner surface of the tubular driven member and said portion of said drive shaft;

said spherical drive element having a diametrical dimension greater than the distance between one of the opposed surfaces of the circular portion of the drive shaft and the opposed inner surface of the tubular member; and

means comprising a plurality of grooves extending about the periphery of said shaft and orthogonal to its axis for retain-

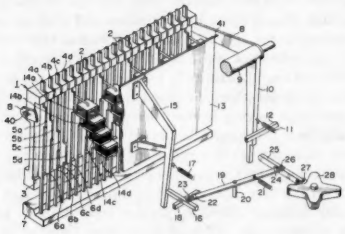
ing said drive element in a relatively stable orbiting path, said grooves of a magnitude many times smaller than the diameter of said drive element; said grooves extending along substantially the entire length of said shaft.

4,275,573

AUTOMATIC NEEDLE SELECTION MECHANISM FOR A KNITTING MACHINE

Takeji Hashimoto, Nagaokakyo; Kiyofumi Okumoto, and Masayasu Andoh, both of Kyoto, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Dec. 17, 1979, Ser. No. 104,269
Claims priority, application Japan, Mar. 14, 1979, 54-23638
Int. Cl.³ D04B *7/00, 15/66*
U.S. Cl. 66—75.2 **3 Claims**



1. For a knitting machine in which a plurality of knitting needles are actuated by a plurality of knitting needle selectors which are arranged side by side in parallel as slidably engaged in a selector bed which is movable to and fro in the longitudinal direction of said needle selectors to actuate said needles, each of said selectors being movable in its lateral direction between a first position in which it is engaged to said movement of said selector bed, and a second position in which it is disengaged from said movement of said selector bed:

an automatic needle selection mechanism, comprising one electromagnet for each of said selectors, and a movable mounting plate, on which said electromagnets are mounted, arranged facing said selector bed and movable towards and away from said selector bed so that each of said electromagnets may be brought adjacent to its corresponding selector when said selector is in its first position; whereby, when all said selectors are in their first positions where they are engaged to said movement of said selector bed, and said mounting plate is first approached to said selector bed, and then said electromagnets are selectively energized, and then said mounting plate is moved away from said selector bed, only those of said selectors which correspond to those of said electromagnets which are energized are moved from their said first positions to their said second positions where they are disengaged from said selector bed, subsequent movement of said selector bed in said longitudinal direction of said needle selectors thereby actuating only selected ones of said needles, in order to form a desired knitting pattern.

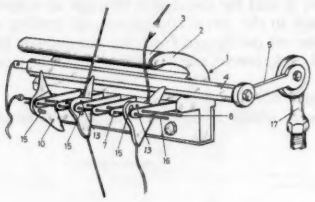
4,275,574

STOP MECHANISM FOR RACHEL OR KETTEN TYPE KNITTING MACHINE

Joaquin M. Muns, Burgos, 3, Rubi, (Barcelona), Spain

Filed Jan. 19, 1979, Ser. No. 5,035
Claims priority, application Spain, Jun. 19, 1978, 236.964
Int. Cl.³ D04B *35/14*
U.S. Cl. 66—163 **5 Claims**

1. A stop mechanism for knitting machines of the Rachel type comprising: a reed with an upper flange fitted with a strengthening section projecting from and along a whole edge for guiding a thread; contact means fixed for thread not forming a nap and being movable and cylindrical for thread producing a nap; said reed having small plates; blade components between said small plates; said blade components being bent to form a groove for guiding the thread; said blade components having each two circular holes and one elongated hole, and



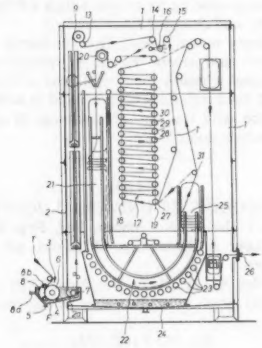
having a tendency for toppling over onto said contact means; said blade components and said small plates being connected by two spindles, said stop mechanism being mounted above lower reeds of said knitting machine.

4,275,575

DEVICE FOR WET PRE-TREATMENT OF WEB-SHAPED TEXTILE MATERIAL IN A DAMPER

Günter Schiffer, Krefeld, Fed. Rep. of Germany, assignor to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

Division of Ser. No. 859,687, Dec. 12, 1977, abandoned. This application Apr. 11, 1979, Ser. No. 29,079
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1976, 2655955
Int. Cl.³ D06B *3/10, 23/18*
U.S. Cl. 68—5 E **10 Claims**

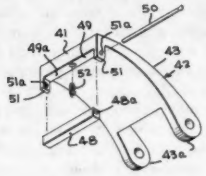


1. A device for subjecting web-shaped textile material to a wet pre-treatment, which includes in combination: a damper having means forming a wall section therewith, a container including means forming a wall therewith and having a textile treating liquor therein, a vacuum device from which the textile material passes directly into said container, said container having a portion extending into said damper in the manner of a waterlock, at least one vertical roller column including two parallel rows of rollers in said damper, means for plaiting the textile material within said damper, means for selectively feeding textile material to either said means for plaiting or the vertical roller column within the damper, and textile material withdrawing means located inside said damper for withdrawing pre-treated textile material from said container and passing said withdrawn textile material fully saturated with treating liquor into said damper.

4,275,576
COMBINATION LOCK FOR SAFE DOORS AND THE LIKE

Harry C. Miller, Nicholasville, Ky., assignor to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Filed Dec. 5, 1979, Ser. No. 100,656
Int. Cl.[3] E05B 15/12, 37/08
U.S. Cl. 70—303 A 10 Claims

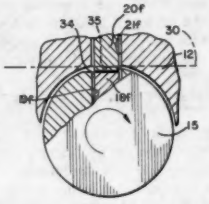


1. In a combination lock for bank vaults, safes and the like, a lock case having a tumbler post therein, a pack of tumbler wheels formed of a plurality of selectively adjustable, peripherally gated tumbler wheels loosely journaled for rotation on said tumbler post about a common axis, a peripherally gated rotatable driving cam fixed on a spindle rotatable about said axis, a manually operable dial and knob member on said spindle for rotating the driving cam to angularly adjust the tumbler wheels to an opening combination for the lock, a bolt slidably supported in said case for movement between projected and retracted positions, means providing a lost motion driving connection between the driving cam and tumbler wheels for adjusting the angular positions of the tumbler wheels, and a fence lever having a pivot connection at one end to the bolt for arcuate movement about the axis of said pivot connection and having an opposite end portion forming a fence end adjacent the peripheries of the driving cam and tumblers, the fence lever being movable arcuately between a raised position locating the fence end outwardly of the peripheries of the driving cam and tumblers and a lower position disposing the fence end in the driving cam gate and tumbler gates when aligned therewith for operatively coupling the driving cam with the fence lever to retract the bolt upon rotation of the driving cam in a predetermined direction; the improvement comprising said fence lever having an upwardly arcuately arching body portion extending from the axis of said pivot connection to a position overlying the pack of tumbler wheels and driving cam and a fence formation extending integrally from said arcuate portion downwardly as a foot formation projecting from the arcuate portion a distance substantially corresponding to the radial depth of the tumbler wheel gates and driving cam gate, and said foot formation having a downwardly facing recess spanning most of the lower end portion thereof and having an elongated unitary contact bar member seated therein extending parallel to said common axis and spanning across the periphery of tumbler wheels and the driving cam to normally bear against the non-gated portion of the driving cam periphery and support the fence lever in said raised position, said contact bar member having a bore extending therethrough parallel to said common axis receiving a supporting pin of slightly smaller diameter than the diameter of said bore and supported in opposite side portions of the fence formation flanking said downwardly opening recess occupied by the contact bar, said contact bar member having a pair of lateral sides and a third side facing the tumbler wheels and driving cam and having a fourth side facing upwardly and spaced slightly from a confronting surface of said recess in said fence formation.

4,275,577
LOCK DEVICE

Jerry L. Castaldo, 413 S. Fairfield, Lombard, Ill. 60148

Filed Mar. 24, 1980, Ser. No. 132,850
Int. Cl.[3] E05B 35/08, 9/04
U.S. Cl. 70—337 4 Claims



1. A locking device selectively operable with either a master key or a subordinate key including:

a core plug adapted to be rotatably disposed within a housing including an axially extending barrel section having a generally circular cross section;

a raised annular flange section disposed at one end of said barrel section;

a plurality of radially outwardly extending coplanar chambers defined in said barrel section;

a centrally disposed axially extending keyway defined in said core plug, said chambers intersecting said keyway;

a plurality of pins, each slidably disposed within a chamber, each of said pins adapted to contact a bitting defined in a key to be inserted in said keyway;

an axially extending step groove defined in an outer periphery of said barrel section parallel to said keyway and intersecting said chambers whereby when a master key is inserted in said keyway, said pins will be urged to the outer periphery of said barrel member so as to allow rotation of said plug with respect to said cylinder in either clockwise or counterclockwise directions, but when said subordinate key is inserted in said keyway, at least one of said pins will be urged only to the outer periphery of said step groove so as to permit rotation of said plug only in one direction.

4,275,578
APPARATUS FOR MANUFACTURING TUBES BY CONTINUOUS HOT ROLLING

Heinrich Steinbrecher, Meerbusch; Johannes Koch, Krefeld, and Manfred Peglan, Duisburg, all of Fed. Rep. of Germany, assignors to Wean United, Inc., Pittsburgh, Pa.

Filed May 7, 1979, Ser. No. 36,920
Claims priority, application Fed. Rep. of Germany, May 10, 1978, 2820865
Int. Cl.[3] B21B 37/00, 17/04
U.S. Cl. 72—14 11 Claims

1. A continuous hot tube rolling mill having several stands arranged in tandem and wherein a mandrel is insertable in a shell having a leading and a trailing end and wherein said mandrel and said shell are pushed between a plurality of rolls in said stands, said rolls of each stand forming a rolling area in which said shell is rolled, the mill further comprising:

a housing for each stand,

a chock assembly for rotatably supporting each said roll in said housing,

means for adjusting the setting of each roll for at least one stand, including displaceable means constructed and arranged to be in contact with each said chock assembly, and having a first adjusting means for displacing said displaceable means to obtain a desired initial rolling area for said one stand and a second adjusting means constructed and arranged to cooperate with said first adjusting means for further displacing said displaceable means to obtain a desired additional rolling area for at least one stand,

means for actuating said first and second adjusting means, and

a transmitter means for detecting a predetermined rolling position of said shell while passing through said stands and for controlling said actuating means of said second adjusting means to adjust in unison said rolls of said one stand to effect said further adjusting of said roll setting.

4,275,579

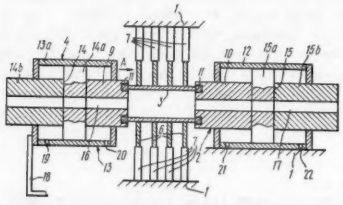
APPARATUS FOR MANUFACTURE OF CORRUGATED PIPES

Vladimir A. Anoshko, ulitsa Shosseinaya, 58, korpus 1, kv. 84; Eduard M. Godin, ulitsa Begovaya, 22, korpus 3, kv. 212; Anatoly N. Gavrilov, Kutuzovsky prospekt, 43, kv. 118, all of Moscow; Garik E. Zverkov, ulitsa Oktyabrskoi revoljutsii, 24, kv. 40, Smolensk; Vladimir I. Matskevich, Moskovsky prospekt, 66, kv. 45, Tolyatti; Valentin M. Chepurin, ulitsa Starodemidovskaya, 8-b, kv. 28; Valentin P. Semenov, prospekt Stroitelei, 8, kv. 180, both of Smolensk; Vladimir V. Grachev, ulitsa Bobruiskaya, 22, kv. 82, Moscow, and Mikhail Y. Butylin, 2 Krasninsky pereulok, 8, kv. 39, Smolensk, all of U.S.S.R.

Filed Nov. 19, 1979, Ser. No. 95,672

Int. Cl.³ B21D *15/06*

U.S. Cl. 72—59 **11 Claims**



1. An apparatus for manufacture of corrugated pipes, comprising: a stand; a pipe blank clamping and sealing assembly mounted upon said stand; a hydraulic drive of said clamping and sealing assembly, mounted upon said stand; a pipe blank axial compression device mounted upon said stand; a shaping fluid source; an electric power source; a device for feeding compressed shaping fluid from said shaping fluid source to the internal space of a pipe blank, said device being mounted on said stand, tools arranged on said stand symmetrically relative to the direction of compression of said pipe blank and reciprocating across said direction of compression for at least partial embracing of said pipe blank; and a drive for reciprocal movement of said shaping tools; said clamping and sealing assembly incorporating two clamps positioned coaxially at a certain distance from each other for locating said pipe blank between them; said hydraulic drive of said clamping and sealing assembly comprising: a source of compressed gas, hydraulic cylinders wherein a movable link of each said hydraulic cylinder is provided with a through passage, said movable link in each said hydraulic cylinder being mechanically coupled with respective one of two clamps for clamping and sealing said pipe blank, and the other movable link in one said hydraulic cylinder serving for axial compression of said pipe blank; a double-acting pneumohydraulic booster the hydraulic chambers whereof communicate with the respective chambers of said hydraulic cylinders through a hydraulic distribution gear and the pneumatic chambers whereof communicate through a pneumatic gear with said compressed gas source; said axial compression device being made in the form of at least one pneumohydraulic booster and at least one two-position pneumoelectric distribution valve connected to said electric power source, said at least one two-position pneumoelectric distribution valve having its outlet in communicating with a pneumatic chamber of at least one pneumohydraulic booster controlling the movement of said other movable link of one of said hydraulic cylinders and its inlet in communication with said compressed gas source; said shaping fluid feeding device including: a pressure regulator communicating through a hydraulic distribution and adjustment gear with said shaping fluid source and with the internal space of said pipe blank through an open-end passage machined in said movable link of the other of said hydraulic cylinders, and a two-position hydraulic distribution valve connected to said electric power source and having its inlet in communication with hydraulic chambers of said pneumohydraulic double-acting booster through the hydraulic distribution gear, and its outlet in communication with said pressure regulator.

4,275,580

SUPPORT VEHICLE FOR ROLL ASSEMBLIES

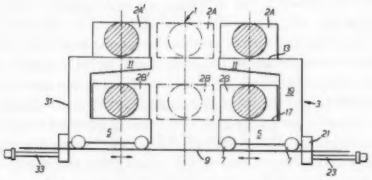
Allan Hayes, Dronfield, England, assignor to Davy-Loewy Limited, Yorkshire, England

Filed Apr. 30, 1979, Ser. No. 34,319

Claims priority, application United Kingdom, May 2, 1978, 17259/78

Int. Cl.³ B21B *31/08*

U.S. Cl. 72—239 **2 Claims**



1. A support vehicle for a pair of roll assemblies for a rolling mill, said mill having a roll changing side wherein said pair of roll assemblies are cantileverly positionable in front of said mill on said roll changing side thereof,

said vehicle comprising a trolley having spaced apart upper and lower support members each providing a support surface for a different one of said pair of roll assemblies,

said roll assemblies removed from or inserted into the mill in a cantilever manner one above the other in a spaced apart relation and with the longitudinal axes of the rolls parallel and substantially horizontal when arranged in a roll changing plane that passes through the axes of said roll assemblies,

the respective spaced apart relation and position of said roll assemblies and said support members being such that said upper and lower support members are positioned or positionable beneath the upper and the lower roll assembly, respectively, when said roll assemblies are in said cantilever manner in said roll changing plane in front of said mill in readiness to be removed from or supported by said support members,

means for moving the trolley relative to said rolling mill in a direction normal to the longitudinal axes of the rolls between a position at one side and remote from said roll changing plane and a position adjacent thereto,

the construction and arrangement of said upper and lower

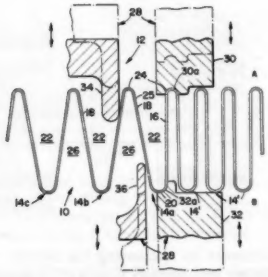
support members being such as to form an opening on a side of said trolley in said direction normal to the longitudinal axes of said rolls to permit unrestricted access to said surfaces when said support members are positioned or are to be positioned beneath said different one of said pair of roll assemblies so that said upper and lower roll assemblies can be removed from or introduced onto said upper and lower support surfaces.

4,275,581

METHOD FOR INCREASING THE FIN DENSITY OF A HEAT EXCHANGER

Kenneth J. Miller, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 23, 1978, Ser. No. 918,630
Int. Cl.³ B21D *13/02*
U.S. Cl. 72—385 **5 Claims**



1. A method of increasing the fin density of a serpentine sheet (**10**) having a plurality of fins (**14*a*, 14*b*, 14*c***), each fin having first (**16**) and second (**18**) diverging sides connected to each other at one rounded end (**20**) thereof with a first space (**22**) therebetween, the other end (**24**) of the first side (**16**) of a fin being connected to the other end (**25**) of the second side (**18**) of the preceding fin to form another rounded end (**24, 25**) and the other end (**25**) of the second side (**18**) of a fin being connected to the other end (**24**) of the first side (**16**) of the succeeding fin, and two adjacent fins having a second space (**26**) therebetween, the method comprising:

(a) vertically moving a first clamping member (**30**) onto the other rounded end (**24, 25**)

(b) vertically moving a second clamping member (**32**) onto the one rounded end (**20**) of one fin;

(c) vertically moving a first blade (**34**) into the first space (**22**) of an adjacent fin succeeding the one fin and into contact with an intermediate area of the first side (**16**) thereof;

(d) vertically moving a second blade (**36**) into the second space (**26**) between the one fin and the adjacent fin and into contact with an intermediate area of the second side (**18**) of the one fin;

(e) moving the first blade (**34**) and the second blade (**36**) laterally towards the first clamping member (**30**) and the second clamping member (**32**) to reduce the divergence of the first (**16**) and second (**18**) sides of a fin; and

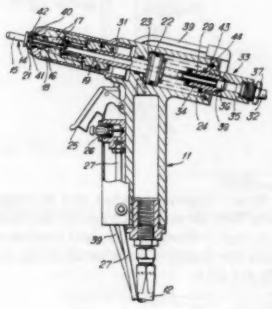
(f) vertically moving the first clamping member (**30**), the second clamping member (**32**), the first blade (**34**) and the second blade (**36**) away from the one fin after moving the first blade (**34**) and the second blade (**36**) laterally.

4,275,582

BREAKSTEM RIVETING TOOL WITH STEM DISPOSAL DEVICE

David J. Sheffield, 66 Varney Rd., Hemel Hempstead, Hertfordshire, and Martyn R. Fulton, 127 Codicote High St., Codicote, Hitchin, Hertfordshire, both of England

Filed Oct. 12, 1979, Ser. No. 84,158
Claims priority, application United Kingdom, Oct. 20, 1978, 41415/78
Int. Cl.³ B21J *15/34*
U.S. Cl. 72—391 **5 Claims**



1. A breakstem riveting tool comprising:

a riveting head including gripping means for gripping the stem of a rivet and for acting on it thereby to place the rivet and subsequently to break off a portion of the stem projecting from the placed rivet;

a passage leading from the gripping means through the riveting head, through which a broken-off stem portion can pass;

a disposal conduit connected to the other end of the passage remote from the gripping means for disposing of a broken-off stem portion which has passed through the passage;

and means for inducing a first stream of air along the disposal conduit in a direction away from its junction with the passage to assist in disposal of a broken-off stem portion thereby, and for inducing a second stream of air along the passage in a direction from the said other end thereof towards the gripping means.

4,275,583

BREAKSTEM RIVETING TOOL WITH STEM DISPOSAL DEVICE

Terence Gilbert, 17 River View, Welwyn Garden City, Hertfordshire, and David J. Sheffield, 66 Varney Rd., Hemel Hempstead, Hertfordshire, both of England

Filed Oct. 12, 1979, Ser. No. 84,169
Claims priority, application United Kingdom, Apr. 20, 1979, 13881/79
Int. Cl.³ B21J *15/34*
U.S. Cl. 72—391 **8 Claims**

1. A breakstem riveting tool comprising:

a riveting head including gripping means for gripping the stem of a rivet and for acting on it thereby to place the rivet and subsequently to break off a portion of the stem projecting from the placed rivet;

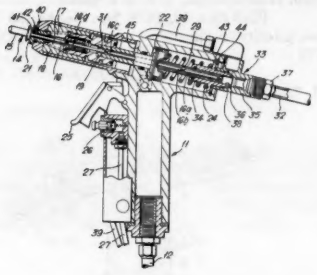
a passage leading from the gripping means through the riveting head, through which a broken-off stem portion can pass;

a disposal conduit connected to the other end of the passage remote from the gripping means for disposal of a broken-off stem portion which has passed through the passage;

means for inducing a first stream of air along the disposal conduit in a direction away from its junction with the passage to assist in disposal of a broken-off stem portion thereby, and for inducing a second stream of air along the

passage in a direction from the said other end thereof towards the gripping means;

and air control means for preventing both air streams from acting on a broken-off stem portion moving from the



passage to the disposal conduit and subsequently for allowing the first air stream to act on the broken-off stem portion to urge it along the disposal conduit in a direction away from the junction without allowing the second air stream to act on it.

4,275,584

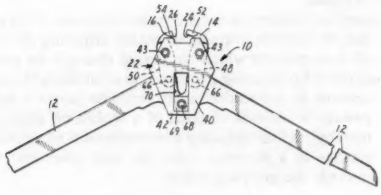
CRIMPING TOOL

William A. Kruschel, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 29, 1979, Ser. No. 70,684

Int. Cl.³ B21D 7/06

U.S. Cl. 72—410 **6 Claims**



1. A tool for crimping sheet metal clasps around overlapped lengths of nonmetallic strapping material, said tool comprising:

a frame;

a platen affixed to said frame including a plurality of parallel ridges, said ridges having spaces therebetween and distal surfaces defining a generally planar support surface adapted to support a base portion of a said sheet metal clasp;

first and second jaws, each of said jaws having an elongate body portion and a projecting ledge portion at one end projecting generally perpendicular to said body portion, said second jaw having a substantially shorter projecting ledge portion than said first jaw, said ledge portions each including a plurality of parallel ridges extending generally parallel to said ledge portion, said ridges having spaces therebetween and distal surfaces defining a generally planar inner crimping surface for the ledge portions, the body portions of said jaws being pivotably mounted on said frame on opposite sides of said support surface with said projecting ledges in opposed relationship for movement between an open position with said jaws spaced from each other and said support surface to afford positioning a base portion of a sheet metal clasp on said support surface with a top portion of the clasp adjacent said first jaw and a locking lip of the clasp adjacent said second jaw, and a closed position with said ledge portions proximate to each other and more closely adjacent said support surface, such that the crimping surface of said first jaw will engage and bend the top portion of the clasp over the overlapped lengths of strapping extending through the clasp, and the crimping surface of said second jaw will engage and bend the locking lip of the clasp over the distal edge of the top portion of the clasp, said ridges on said ledge portions being aligned with said spaces on said platen and said ridges on said platen being aligned with said spaces on said ledge portions to transversely deform the clasp upon movement of said jaws to their closed position;

a pair of elongate handles,

means mounting said handles for pivotal movement relative to each other and for pivotally coupling said handles to said jaws to afford moving said jaws from their open to their closed position.

4,275,585

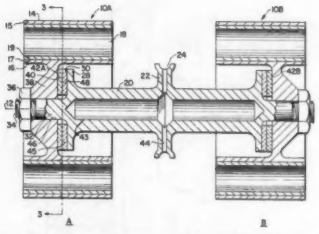
VIBRATOR TYPE DENSITOMETER

Colby E. Buzzell, Wilmington, Mass., assignor to General Electric Company, Wilmington, Mass.

Filed Nov. 21, 1979, Ser. No. 97,038

Int. Cl.³ G01N 9/00

U.S. Cl. 73—32 A **16 Claims**



1. An instrument for measuring the density of an ambient substance having substantially isotropic properties;

said instrument comprising:

spring means positioned to permit torsional deformation thereof around an axis;

a mass assemblage having its center of gravity positioned substantially on said axis, said mass assemblage including structurally defined spaces radially spaced from said axis and open to said ambient substance; and

mechanically stiff coupling means connecting said mass assemblage to said spring means to form a torsional spring mass system including the mass of said ambient substance contained within said spaces, said system being capable of oscillatory motion around said axis at a natural resonant system torsion frequency dependent on the density of the ambient substance contained in said spaces;

the respective natural resonant torsion frequencies of said coupling means and of said mass assemblage being selected to be high with respect to said natural resonant system torsion frequency;

said coupling means including transducer means adapted to convert between electrical energy and potential energy stored as deformation around said axis, the natural resonant torsion frequency of said transducer means being selected to be high with respect to the natural resonant torsion frequency of said spring means, said transducer means being located at the torsion shear interface between said spring means and said mass assemblage substantially normal to said axis, said transducer means being positioned to take substantially the full shear load between said spring means and said mass assemblage while remaining substantially stiff relative to the spring effect of said system;

whereby said instrument is substantially immune to temperature variations affecting said transducer means.

4,275,586

OSCILLATION SENSOR, PARTICULARLY COMBUSTION ENGINE KNOCK SENSOR

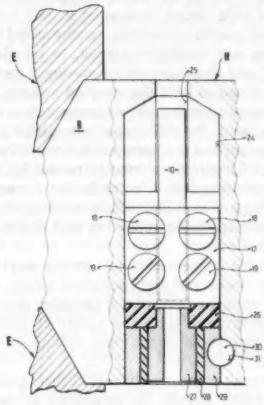
Theodor Gast, Berlin, and Kurt Binder, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 16, 1979, Ser. No. 3,811

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1978, 2801969

Int. Cl.³ G01L *23/22*

U.S. Cl. 73—35 17 Claims



13. For combination and assembly with an internal combustion engine (E),

a sensor to generate an electrical signal upon occurrence of engine knock comprising

an adjustable clamping device (**11**; **16**, **17**, **18**, **19**; **21**, **22**, **23**) shaped and arranged for rigid attachment to said engine and

a piezoelectric element (**10**) held by said clamping device in cantilevered configuration to permit substantially only bending oscillation thereof,

wherein said engine (E) is formed with a cylindrical receiver bore (**24**), said clamping device being shaped and arranged to fit into said bore and securing said sensor within the bore (**24**) in said engine.

4,275,587

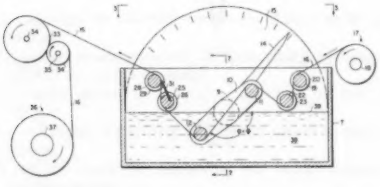
METHOD AND APPARATUS FOR DYNAMIC WETTING ANGLE MEASUREMENT

Edgar B. Gutoff, Brookline, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 1, 1979, Ser. No. 81,089

Int. Cl.³ G01N *13/02*

U.S. Cl. 73—64.4 8 Claims



1. The method of measuring the dynamic contact angle between a liquid and a solid surface moving into the liquid, comprising the steps of moving said surface into the liquid at a constant speed, adjusting the angle at which said surface enters the liquid by rotation of said surface about a fixed axis until the dynamic contact angle is equal to the angle between said surface and the quiescent surface of the liquid remote from the meniscus, and detecting said adjusted angle.

4,275,588

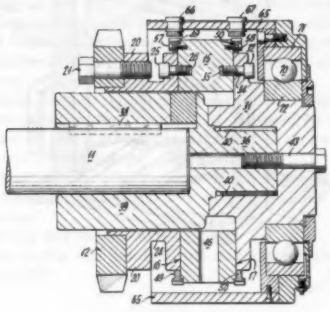
HEAVY DUTY DYNAMIC HIGH-TORQUE-MEASUREMENT COUPLING UNIT

Herbert A. Rundell, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 31, 1979, Ser. No. 108,869

Int. Cl.³ G01L *3/14*

U.S. Cl. 73—862.32 7 Claims



1. Heavy-duty dynamic high-torque-measurement coupling unit for interconnecting a torque-load-transmitting shaft with a lateral drive, comprising in combination

an annular torque transmitting element having a pair of opposed faces spaced axially apart,

gear means rigidly attached to one of said faces for coupling said lateral drive,

means for rigidly attaching said shaft to the other of said faces, and

means for dynamically measuring the amount of relative angular displacement between said faces,

said element having radial openings between said faces to permit said relative angular displacement under torque load.

4,275,589

METHOD AND APPARATUS FOR NON-DESTRUCTIVE INSPECTION OF TIRES

Doyle L. Dugger, Muscatine, Iowa, and Morris D. Ho, Walnut Creek, Calif., assignors to Bandag Incorporated, Muscatine, Iowa

Filed Apr. 19, 1979, Ser. No. 31,963

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—146 46 Claims

1. A nondestructive tire testing apparatus for ultrasonically inspecting the wall or casing of a rubber tire, said apparatus comprising:

tire mounting means for rotatably mounting said tire,

an ultrasonic acoustic transmitter for transmitting ultrasonic acoustic signals,

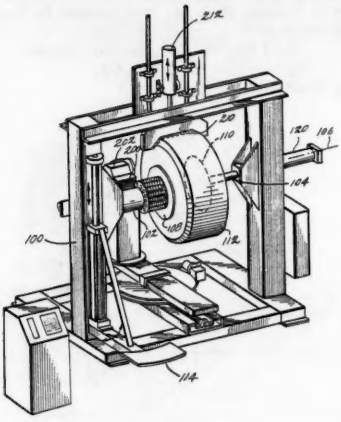
an ultrasonic acoustic receiver for receiving said ultrasonic acoustic signals and for transducing them into corresponding ultrasonic electrical signals,

moveable transducer mounting means mounting at least one of said transmitter and receiver for relative movement away from each other and from the tire wall during tire mounting operations and for opposite movements thereafter so as to operatively space the receiver from said transmitter on opposite sides of a single tire wall to receive ultrasonic acoustic signals from said transmitter after

passage through predetermined areas or tire testing sites of said tire wall,

electrical pulsing circuits connected to repetitively electrically activate said ultrasonic acoustic transmitter and to cause the generation of corresponding repetitive bursts or pulses of said ultrasonic acoustic signals,

gated receiver circuits connected to provide electrical measurement signals representing the relative strength of ultrasonic acoustic signals received by said receiver during repetitive gated time intervals which intervals are synchronized to include only the initial portions of each received burst of said ultrasonic acoustic signals, and



display means connected to receive said electrical measurement signals and to provide humanly sensible output indications representing the condition of said tire wall.

4,275,590

GAS FLOW MEASURING APPARATUS

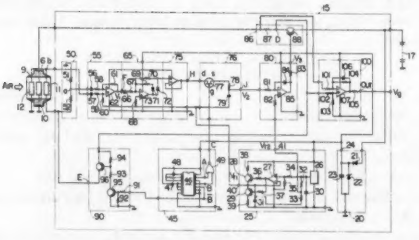
Hisasi Kawai, Toyahashi; Tsuneyuki Egami, Aichi; Tokio Kohama, Nishio, and Hideki Obayashi, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 27, 1979, Ser. No. 97,665

Claims priority, application Japan, Dec. 27, 1978, 53/162705

Int. Cl.[3] G01F *1/68*

U.S. Cl. 73—204 **5 Claims**



1. A gas flow measuring apparatus comprising:

an electric heater provided in a flow measuring tube disposed in a duct through which a gas to be measured flows;

a first temperature dependent resistor provided in said tube to be situated on the downstream side of said electric heater;

a second temperature dependent resistor provided in said tube and connected in series with said first temperature dependent resistor, said second temperature dependent resistor being situated at a position where substantially no thermal influence of said electric heater is exerted;

first and second reference resistors connected in series with each other and combined with said first and second temperature dependent resistors to form a bridge circuit;

an oscillation circuit for oscillating pulse signals;

an AC differential amplifier connected between a junction of said first and second temperature dependent resistors and a junction of said first and second reference resistors, for AC-amplifying the voltage between said junctions;

a rectifying circuit connected to said AC differential amplifier circuit to rectify an output voltage thereof;

a sample-and-hold circuit connected to said rectifying circuit and said oscillation circuit, synchronized with a pulse signal from said oscillation circuit, to sample an output voltage of said rectifying circuit during a part of a duration thereof and to hold the sampled voltage;

a DC differential amplifier circuit connected to said sample-and-hold circuit, for differentially amplifying the output voltage thereof and a constant reference voltage;

a power amplifier circuit connected to said DC differential amplifier circuit and said electric heater, for amplifying an output voltage of said DC differential amplifier circuit to control a voltage to be applied to said electric heater by the amplified output;

a chopper circuit connected to said power amplifier circuit, said bridge circuit and said oscillation circuit, for making the output voltage of said power amplifier circuit intermittent in synchronism with the signal of said oscillation circuit to supply the intermittent voltage to said bridge circuit; and

a detecting circuit connected to said electric heater and said power amplifier circuit, for producing an output signal representative of the amount of flow of the gas to be measured.

4,275,591

PROTECTIVE SHIELD FOR CAPILLARY PIPETTE

Bruce Wand, Randolph Township, Morris County, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed Jul. 25, 1977, Ser. No. 818,617

The portion of the term of this patent subsequent to Jun. 30, 1998, has been disclaimed.

Int. Cl.[3] B01L *3/02;* G01N *1/14*

U.S. Cl. 73—425.4 P **5 Claims**

1. A protective shield for a capillary pipette extending from a pipette assembly comprising:

a hollow tubular, substantially rigid body closed at one end and open at the other end, said body being sufficiently long to envelop a capillary pipette extending from a pi-

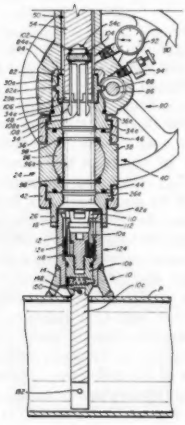
pette assembly when said open end is connected to said assembly, said body having a conical portion and a substantially cylindrical portion having a larger diameter than the widest diameter of said conical portion, said closed end being the apex of said conical portion and said open end being at the opposite end of said body and opening into said cylindrical portion, said body including a laterally extending flange surrounding said open end and a shoulder integrally connecting the conical and substantially cylindrical portions, the widest part of said shoulder on the outside surface of said body having a diameter greater than the diameter of said open end, said shoulder providing stop means for preventing over extension of the closed end when used as a puncturing device, said conical and substantially cylindrical portions of said body tapering outwardly from the closed end toward the open end in varying predetermined degrees along their lengths, said shoulder being positioned at a predetermined distance from the closed end, said tapered body and said shoulder facilitating the nesting of this shield within a lower shield of the same type whereby locking is prevented so that separation of the nested shields occurs under the force of gravity when the inner nested shield is removed from the lower shield by holder means.

4,275,592

EXTRACTOR TOOL AND HOLDER

John E. Atwood; John L. Baugh; William M. Koehler, and David K. Waterman, all of Houston, Tex., assignors to McMurry-Hughes, Inc., Huntsville, Tex.

Filed Jan. 5, 1979, Ser. No. 1,224
Int. Cl.³ G01N *17/00*
U.S. Cl. 73—432 R **59 Claims**



1. Apparatus for use with containers of fluid under pressure comprising:

(a) landing means generally circumscribing a passage to the interior of such a container;

(b) holder means for selective mounting on said landing means;

(c) seal means for sealing said holder means to said landing means;

(d) anchor means for anchoring said holder means to said landing means;

(e) said holder means including a drive screw, and said anchor means including threads on said drive screw and threads on said landing means whereby said drive screw may be threadedly engaged with said landing means;

(f) orientation means for automatically retaining at least a portion of said holder means in a preselected rotational orientation relative to said landing means when said holder means is sealed and anchored to said landing means;

(g) manipulating tool means for selectively maneuvering said holder means, including:

(i) placement means for selectively engaging said holder means;

(ii) first means for selectively imparting translational motion to said placement means; and

(iii) second means for selectively imparting rotational motion to said placement means.

23. A method of removing equipment from a fitting on a container of fluid, whereby said equipment communicates with the interior of said container, comprising the following steps:

(a) mounting a manipulating tool on said fitting wherein said tool includes a valve, a housing connected to said valve opposite the fitting, and a placement device extendable through said valve;

(b) connecting said placement means to said equipment;

(c) disengaging said equipment from said fitting by imparting torque to said placement means to rotate said equipment relative to said fitting;

(d) retracting said placement means, with said equipment attached, through said valve at least partially into said housing;

(e) closing said valve; and

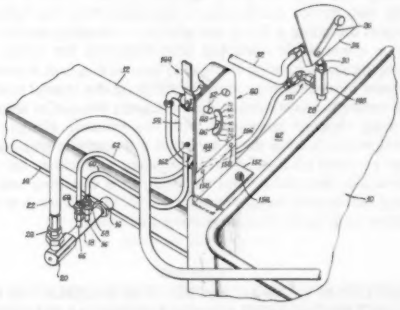
(f) disengaging said housing from said valve to expose said equipment.

4,275,593

SPECIFIC GRAVITY METER FOR AIRCRAFT DE-ICING EQUIPMENT

Walter E. Thornton-Trump, 108 Bellvue Dr., Beaver Lake, Plattsmouth, Nebr. 68048

Filed Apr. 6, 1979, Ser. No. 27,924
Int. Cl.³ G01N *9/16*
U.S. Cl. 73—454 **13 Claims**



1. Apparatus for use in aircraft de-icing equipment of the type which has means for pumping an aqueous de-icing solution through a nozzle onto an aircraft or the like to remove ice and snow therefrom and to prevent the accumulation thereof on the aircraft, said apparatus providing a measurement of the proportion of ethylene glycol in the aqueous solution that is flowing through the nozzle, and comprising:

means connected upstream of the nozzle for communicating the solution to and from a reservoir means;

means defining a reservoir for receiving the solution, the reservoir means having a transparent face portion through which indicator means can be viewed;

pointer means pivotally mounted within said reservoir means and being adapted to reach a vertical position that varies in direct proportion to the amount of ethylene glycol that is present in the solution; and,

indicating means adjacent said pointer means for providing accurate graduated increments of the proportion of ethyl-

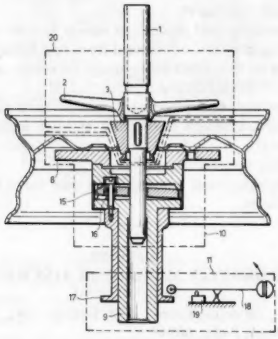
ene glycol in the solution and thereby enable an observer to view the pointer means and indicating means and obtain an accurate measurement of the proportion of ethylene glycol in the solution.

4,275,594

WORKPIECE CLAMPING DEVICE

Gábor Varga; Ferenc Szabó; Ferenc Sztanyik; László Vágvölgyi, and Jozsef Nemeth, all of Budapest, Hungary, assignors to Csepel Müvek Hiradastechnikai Gepgyara, Budapest, Hungary

Filed Apr. 24, 1979, Ser. No. 33,120
Claims priority, application Hungary, Apr. 24, 1978, OE 1162
Int. Cl.³ G01M *1/02*
U.S. Cl. 73—487 **12 Claims**



1. In a wheel balancing apparatus, a wheel clamping device for the fast, central clamping of wheels provided with holes of various numbers and pitch diameter and/or with a central hole, said device comprising a disc supporting the wheel, a support including a fixing mechanism, a releasing mechanism, and a connectable clamping unit including the wheel, the clamping unit including a threaded central mandrel, a pressure element moveable in an axial direction on the central mandrel and secured against turning with a respect thereto, at least one locating element connected with the pressure element and fitting into a hole in the wheel, and a threaded clamping element screwed on the mandrel, the fixing mechanism having a sleeve receiving the central mandrel of the clamping unit, the fixing mechanism being connected with the releasing mechanism as well as the disc supporting the wheel.

4,275,595

PROCESS AND INSTALLATION FOR PRODUCING AND RECORDING ULTRASONIC SECTIONAL IMAGES

Dieter Hassler, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 23, 1979, Ser. No. 5,864
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1978, 2806176
Int. Cl.³ G01N *29/00;* **H04N** *3/00*
U.S. Cl. 73—606 **22 Claims**

1. A method for producing and recording ultrasonic sectional images, said method comprising:

(a) scanning an examination subject line-by-line with ultrasonic transmission signals and producing from the resulting echo signals (E_n through E_{n+4}) representing successive lines of an ultrasonic image of the examination subject, a time series of echo lines (Z_n through Z_{n+4}) occurring at a selected echo line rate,

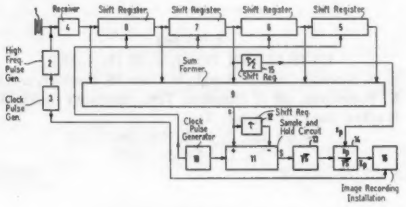
(b) writing a selected number of echo lines (Z_n through Z_{n+3}) into a corresponding number of intermediate memories (**5, 6, 7, 8**) of a first memory unit such that echo signal information is available for obtaining a mean value (S) of echo intensity of a pertinent field (U) in the vicinity of a given point (P) of the ultrasonic image,

(c) reading out from the intermediate memories (**5, 6, 7, 8**) samples ($X_{i,n}$) from the respective stored echo lines (Z_n through Z_{n+3}),

(d) forming from echo signal information comprising the intensities of the samples ($x_{i,n}$) as read out over a given time interval (τ), representing a desired depth for the pertinent field (U) in the vicinity of the given point (P) of the ultrasonic image, a mean value signal (S) representing the mean value of the pertinent field (U) in the vicinity of the given point (P) of the ultrasonic image,

(e) supplying a point-representative echo signal (xp) in accordance with the echo intensity for the given point (P) of the ultrasonic image, and

(f) forming a relationship signal (e.g. $x_p/\sqrt{S}$) in accordance with a predetermined relationship of the point-representative echo signal (xp) to the mean value signal (S) for the given point, and recording a signal in accordance with such relationship signal to represent the given point (P) of the ultrasonic image,



(g) the forming of the mean value signal (S) for the pertinent field (U) in the vicinity of the point (P) according to step (d) being effected by:

(g1) supplying from the echo signal information successive samples ($x_{i,n}$) to a summing means (**9**) so as to form successive sum signals representing the sums of the intensities of points of the successive echo lines (Z_n through Z_{n+4}) defining the pertinent field (U) in the vicinity of the given point (P), and

(g2) supplying the successive sum signals from the summing means (**9**) to a second memory unit (**11**), and to a third memory unit (**12**) having a time delay corresponding to said given time interval (τ) to provide as its output successive delayed sum signals, and in the second memory unit (**11**) summing the successive sum signals supplied thereto, and supplying as the mean value signal (S) for the given point (P) a signal which is a function of the difference between the summation of the sum signals supplied to the second memory unit (**11**) during said given time interval (τ) and the output from the third memory unit (**12**).

4,275,596

OPTICAL BICHROMATIC POSITION FINDER

Michael Horn, Sound Beach, N.Y., assignor to Optsonic Research Associates, Inc., New York, N.Y.

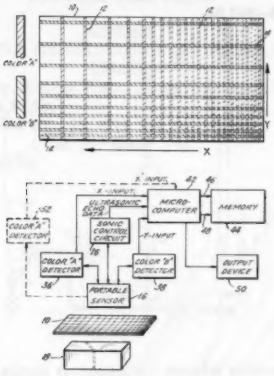
Filed Dec. 10, 1979, Ser. No. 102,241
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—607 **10 Claims**

1. A position determining device, comprising:

screen means having a surface, said surface being colored with a first color, the intensity of said first color on said surface varying according to a first selected mathematical relation along a first direction on said surface, and said surface being further colored with a second color, the intensity of said second color on said surface varying according to a second selected mathematical relation

along a second direction on said surface oblique to said first direction;

a portable sensor which may be moved across said screen means; and



detector means attached to said portable sensor for measuring the respective intensities of said first and second colors at a location on said surface corresponding to the instantaneous position of said sensor with respect to said screen means.

4,275,597

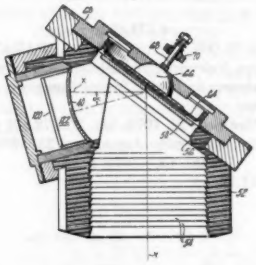
ULTRASONIC BEAM SCANNING TECHNIQUE AND APPARATUS

Phillipp J. Quedens, Berlin; Ronald A. Huverl, Andover, and Milton Stoller, West Hartford, all of Conn., assignors to SmithKline Instruments, Inc., South Windsor, Conn.

Filed Jul. 11, 1977, Ser. No. 814,476

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—618 **25 Claims**



1. Apparatus for generating a scanning energy beam for non-destructive and non-invasive testing comprising:

transducer means, said transducer means being responsive to electrical drive signals for generating ultrasonic energy, the thus generated ultrasonic energy being radiated in the form of a beam having an axis;

reflector means positioned in the path of the beam of ultrasonic energy radiated from said transducer means whereby said energy will impinge upon a first surface of said reflector means thereby changing the direction of travel of the ultrasonic energy, an axis through the center of said reflector means intersecting the axis of said beam of ultrasonic energy;

drive shaft means engaging a second side of said reflector means disposed oppositely to said first surface thereof;

arm means, said arm means being coupled at a first end to said drive shaft means and being variable in length;

means pivotally supporting said arm means adjacent the second end thereof, said supporting means permitting longitudinal movement of at least a portion of said arm means to vary the effective length thereof;

first motor means;

first cam means connected to said arm means and driven by said first motor means, said first cam means imparting a pivoting motion to said arm means;

second motor means; and

second cam means driven by said second motor means, said second cam means cooperating with said arm means to vary the longitudinal position of the first end thereof whereby said drive shaft means will move in a first direction in response to motion of said first cam means and will move in a second direction generally transverse to said first direction in response to movements of said second cam means.

4,275,598

ULTRASONIC TESTING DEVICE

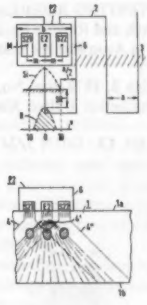
Günter Engl, Erlangen-Büchenbach, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Continuation of Ser. No. 923,382, Jul. 10, 1978, abandoned. This application Feb. 4, 1980, Ser. No. 117,862

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1977, 2732090

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—622 **7 Claims**

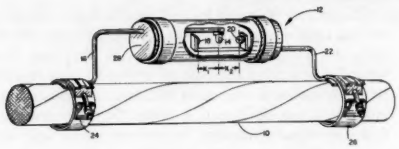


1. Device for volumetric testing of pressure-vessel walls and pipes with a combined transmit-receive test head for scanning a sinuous test track having a given test-track spacing, comprising an oscillator unit including an oscillating crystal and a receive oscillating crystal having respective centers spaced apart a distance smaller than that of the test-track spacing so that the test head has a full width within which at least one additional oscillating crystal is accommodated, said additional oscillating crystal being paired with one of said transmit and receive oscillating crystals so as to form therewith another oscillating unit including a transmit oscillating crystal and a receive oscillating crystal having centers spaced apart a distance smaller than that of the test-track spacing, the distance between the crystals of both of said oscillator units being substantially equal, said additional oscillating crystal being a transmit crystal when said one crystal with which it is paired is a receive oscillating crystal, and being a receive oscillating crystal when said crystal paired therewith is a transmit oscillating crystal.

4,275,599
SENSOR FOR MEASURING DYNAMIC VARIATIONS IN STRAIN

Charles W. Kohlenberger, Fullerton; Craig G. Kirkpatrick, Santa Ana; John A. Estrada, South San Gabriel, and George Q. Chang, La Habra, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 20, 1979, Ser. No. 105,690
Int. Cl.[3] G01B 11/16
U.S. Cl. 73—774 5 Claims

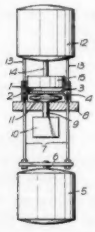


1. A strain sensor, comprising:
a first bracket having a pair of photodetectors mounted thereon, wherein said photodetectors are spaced apart from each other;
a second bracket having a light source mounted thereon;
means for fastening said first and second brackets to a deformable structure in a manner which disposes said light source intermediate said pair of photodetectors so that strain occurring in said elastic structure causes the distances between one of said photodetectors and said light source to decrease while the distance between the other of said photodetectors and said light source increases; and
a sealing container enclosing said light source and said pair of photodetectors.

4,275,600
TESTING RUBBER

Donald M. Turner, Bath, and Richard Smith, Melksham, both of England, assignors to Avon Rubber Company Limited, Melksham, England

Filed May 3, 1979, Ser. No. 35,511
Claims priority, application United Kingdom, May 9, 1978, 18546/78
Int. Cl.[3] G01N 3/24
U.S. Cl. 73—843 13 Claims

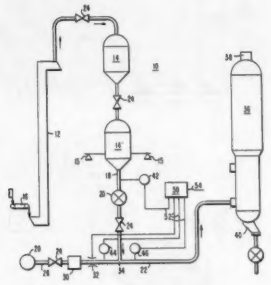


1. In apparatus for testing a material selected from the group consisting of unvulcanized natural rubber, unvulcanized synthetic rubber and elastomers having the same properties as unvulcanized rubber, said apparatus having a test chamber and a rotor in the test chamber, the improvement comprising wall means defining an ascertained fixed volume for the test chamber, at least one transfer port through a wall of the test chamber for rendering the transfer chamber in communication with the test chamber, means for exerting pressure on material in the transfer chamber, whereby a controlled pressure can be applied to and maintained on material in the test chamber through the at least one transfer port, and sensor means for recording back-rotation of the rotor.

4,275,601
SOLIDS MASS FLOW DETERMINATION

Joseph E. Macko, Hempfield Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 11, 1979, Ser. No. 102,500
Int. Cl.[3] G01F 1/68, 1/74
U.S. Cl. 73—861.04 4 Claims

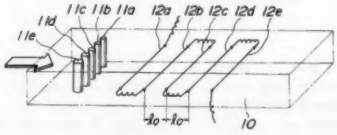


4. In a system wherein carbonaceous particulate matter is mixed with a flowing fluid to produce a flowing solids-fluid mixture, said particulate matter having a heat capacity and said fluid having a differing heat capacity, apparatus for identifying the mass flow rate of said particulate matter, comprising:
a. means for establishing a temperature differential between said particulate matter and said fluid;
b. means for determining the mass flow rate of said flowing fluid;
c. means for determining the temperature of said fluid prior to mixing with said particulate matter;
d. means for determining the temperature of said particulate matter prior to mixing with said fluid;
e. means for determining the equilibrium temperature of said flowing mixture; and
f. means for correlating the determined temperatures, fluid flow rate and known heat capacities in a heat balance to determine the mass flow rate of said particulate matter.

4,275,602
FLUID FLOW MEASURING APPARATUS

Takeshi Fujishiro, Yokosuka, and Hiroshige Ozawa, Zushi, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 25, 1979, Ser. No. 78,691
Claims priority, application Japan, Sep. 25, 1978, 53-117592
Int. Cl.[3] G01F 1/32
U.S. Cl. 73—861.22 8 Claims



1. An apparatus for measuring flow rate of a fluid by detecting Karman vortices and comprising a conduit through which the fluid is permitted to flow, vortex shedding means disposed within the conduit and extending across the flow direction of the fluid, and at least two vortex detecting means disposed downstream of the vortex shedding means and spaced from each other by an amount corresponding to the distance between the vortices, the vortex shedding means comprising a plurality of vortex shedding members each having a different effective size, said effective size of any one vortex shedding

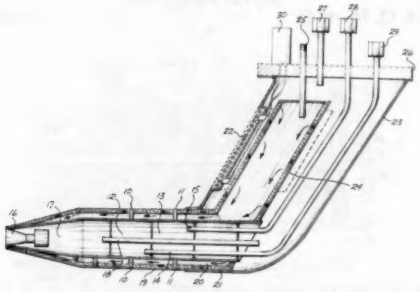
member being the size required to produce a given distance between vortices generated by that one vortex shedding member, each distance between the vortex detecting means being selected to be within the range between the maximum and the minimum distance between the vortices shed by said members.

4,275,603

INDIRECTLY HEATED AIRCRAFT PROBES AND MASTS

Joseph Kalocsay, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 23, 1979, Ser. No. 96,857
Int. Cl.³ G01F *1/46*
U.S. Cl. 73—861.68 **3 Claims**



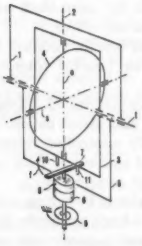
1. In a probe structure havng a pitot or combined pitot-static pressure tube and including an inner pressure chamber disposed within an outer shell for providing a heating chamber, means for providing indirect heating of said heating chamber comprising heating means outside said heating chamber and further including heat pipe means coupled between said heating chamber and said heating means.

4,275,604

DEVICE FOR THE LEVELING OF THE GYROSCOPIC AXIS OF A COMPASS WITH A MECHANICAL SUSPENSION AND AN ANTIPENDULAR-TORQUE PRECESSION SYSTEM

Piero M. Derossi, Corso Giovanni Lanza 55, Torino, Italy

Filed Dec. 28, 1978, Ser. No. 973,812
Claims priority, application Italy, Dec. 30, 1977, 69956 A/77
Int. Cl.³ G01C *19/26, 19/30, 19/38*
U.S. Cl. 74—5.12 **7 Claims**



1. In a gyrocompass comprising a mechanical suspension including a support rotatable about an at least approximately vertical compass axis and a tilt ring pivoted on said support for rotation about an at least approximately horizontal tilt axis, a gyrosphere pivoted on said tilt ring for rotation about an orientation axis perpendicular to said tilt axis, a motor-driven gyroscopic mass mounted within said gyrosphere for rotation about a spin axis perpendicular to said orientation axis, an antipendular-torque precession system mounted on said suspension for oscillation about said spin axis, a pendular system mounted on said suspension for oscillation about said tilt axis, and releasable coupling means for interlocking said pendular system and said tilt ring to override the effect of said precession system during periods of standstill of the gyroscope,

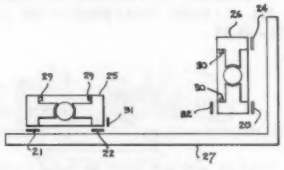
the improvement wherein said coupling means comprises a rocking lever carried on said pendular system, actuating means for swinging said rocking lever in a substantially horizontal plane between an idle position and a working position, and coacting means on said tilt ring engageable by said rocking lever in said working position for immobilizing said tilt ring relatively to said pendular system.

4,275,605

ACCELERATION SENSITIVE GYROSCOPE STABILIZED PLATFORM

John M. Kennel, Santa Ana, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 13, 1978, Ser. No. 968,998
Int. Cl.³ G01C *19/54*
U.S. Cl. 74—5.34 **5 Claims**



1. A method for reducing operating errors in a gyroscope comprising:

(a) introducing a preselected mass unbalance along the axis of the gyroscope so as to cause precession of the gyroscope about the direction of any apparent acceleration,

(b) measuring the precession rate of the gyroscope due to any apparent acceleration,

(c) sensing the apparent acceleration of the gyroscope by means of accelerometers mounted on a platform containing the gyroscope, and

(d) compensating for a precession of said gyroscope about any apparent acceleration by sensing the apparent acceleration and calculating and computationally compensating for the precession due to any such apparent acceleration.

4. A system for reducing operating errors in a gyroscope comprising:

(a) a platform,

(b) a gyroscope mounted on the platform with at least one degree of orientational freedom,

(c) a plurality of accelerometers mounted on the platform for sensing the apparent acceleration of the platform,

(d) means for measuring the rate of precession of the gyroscope,

(e) means for accurately measuring a rate of precession of the gyroscope due to acceleration, and

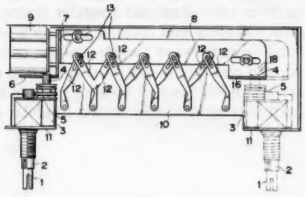
(f) means for compensating for the precession of the gyroscope about the direction of any acceleration by computing the precession of the gyroscope due to any apparent acceleration and computationally compensating for the precession.

4,275,606

PUSHBUTTON TUNER

Yasuhisa Nishikawa, and Ryoichi Hasumi, both of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jul. 18, 1979, Ser. No. 58,665
Int. Cl.³ H03J *1/06, 5/12*
U.S. Cl. 74—10.39 **2 Claims**



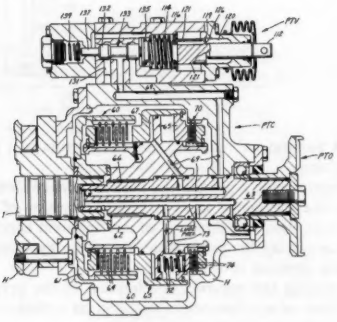
1. A pushbutton tuner comprising a plurality of tuning coils; cores adapted to be put into or drawn out from said tuning coils, respectively; a core slide for causing said cores to move relative to said coils; and fine tuning operating means; said core slide has at opposite ends thereof portions for engaging with said fine tuning operating means.

4,275,607

POWER TRANSMISSION HAVING POWER TAKE-OFF SHAFT AND FLUID CONTROL MEANS THEREFOR

Joseph B. Snoy, Rockford, Ill., assignor to Twin Disc, Incorporated, Racine, Wis.

Filed Jun. 28, 1979, Ser. No. 52,801
Int. Cl.³ F16H *37/00;* **F16D** *67/04, 13/74*
U.S. Cl. 74—15.63 **6 Claims**



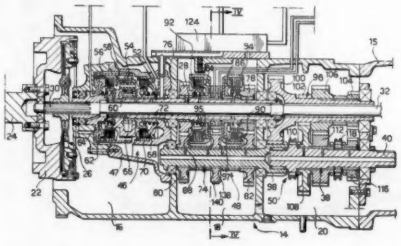
1. In a tractor power transmission having a change speed gear mechanism mounted in a non-rotatable housing and for propelling the tractor over the ground at different speeds, a power input shaft for said mechanism, said mechanism including a duplex clutch assembly mounted on said input shaft, said assembly including a pair of selectively engagable clutches each having a gear for transmitting power through said mechanism; a power take-off shaft journalled adjacent said input shaft and in coaxial alignment therewith, said power take-off shaft having means for connection to an implement or the like to be driven by said power take-off shaft; a duplex clutch for (1) selectively detachably connecting said shafts together or (2) disconnecting said shafts and locking said power take-off shaft to the transmission housing, a hub splined to said power take-off shaft for rotation therewith, said duplex clutch including a hydraulically actuated friction plate clutch connected to and between said power shaft and said hub for forming a driving connection between said shafts, said duplex clutch also having a brake between said housing and said hub, a piston axially slideable on said hub and defining an expansible fluid chamber therewith for actuating said friction plate clutch, said piston and hub also defining a second chamber, spring means in said second chamber, and a fluid passage in said hub and communicating with said second chamber for conducting lubricating fluid to said second chamber, whereby said spring means and said lubricating fluid act together to bias said brake to an engaged position for locking said hub and said power take-off shaft to said housing when said clutch is disconnected.

4,275,608

GEARBOX FOR AN AGRICULTURAL TRACTOR

Emiliano Brancolini, Sorbara, Italy, assignor to Fiat Trattori S.p.A., Modena, Italy

Filed Aug. 13, 1979, Ser. No. 66,141
Claims priority, application Italy, Nov. 28, 1978, 69717 A/78
Int. Cl.³ F16H *37/00*
U.S. Cl. 74—15.63 **3 Claims**



1. A speed change gearbox for agricultural tractors and similar vehicles, the gearbox comprising

a casing of elongate form;

an input shaft rotatably mounted in the casing and extending longitudinally therethrough to project from opposite ends of the casing, the projecting end portions of the input shaft respectively receiving drive from an engine of the vehicle and constituting a power take-off;

an output shaft rotatably mounted in the casing parallel to the input shaft and projecting from the casing at the end corresponding to the power take-off;

reduction means housed in said casing and selectively operable to provide one of a plurality of reduction ratios between said input shaft and an output drive shaft of the reduction means, said reduction means comprising first and second mechanical reduction stage interconnected in series with each other by a hollow transmission shaft which surrounds said input shaft, the first stage being constituted by an epicyclic gear mechanism which coaxially surrounds the input shaft and the transmission shaft and includes a sun wheel

a crown wheel fast for rotation with the input shaft

a planet carrier fast for rotation with the transmission shaft,

a hydraulically controlled friction clutch for selectively connecting said planet carrier with the input shaft, and

a hydraulically controlled friction brake for selectively locking said sun wheel with respect to the casing, the second stage comprising

driven gear wheels keyed on said drive shaft,

driving gear wheels coaxially surrounding the transmission shaft and in continuous mesh with corresponding ones of said driven gear wheels, and

hydraulically controlled friction clutches for selectively connecting each said driving gear wheel to the transmission shaft, each such clutch being disposed around said transmission shaft; and

a final mechanical gear stage serving to establish a connection between the output drive shaft of the reduction means and the said output shaft of the gearbox, the final stage being selectively operable to set one of a plurality of

forward gearing ratio ranges or at least one reverse gearing range with the actual reduction ratio through the gearbox in the selected range being dependent on the selected ratio of said reduction means.

4,275,609

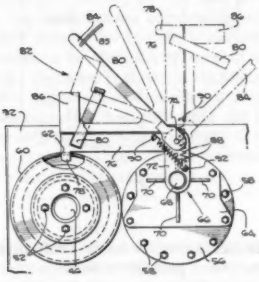
POSITIVE SAFETY BRAKE FOR OIL WELL PUMPING APPARATUS

Gene DeLaney, P.O. Box 283, San Ardo, Calif. 93450

Continuation-in-part of Ser. No. 61,859, Jul. 30, 1979, abandoned. This application Oct. 15, 1979, Ser. No. 84,838

Int. Cl.³ F16H *21/32, 57/10*

U.S. Cl. 74—41 **5 Claims**



1. In oil well pumping apparatus wherein a motor drives a gear box having a rotating shaft and a crank, the shaft including a cylindrical brake drum rotating therewith having a brake shoe disposed for slidable engagement therewith to impede rotation of the shaft, the gear box also having counter-balance weights moving combination therewith and wherein the crank is connected through a Pitman arm to a walking beam, the improvement for locking the crank during inadvertent rotation as a safety measure during servicing and positioning of the apparatus comprising:

(a) first locking means carried by the shaft for rotation therewith, said first locking means comprising a rotating member carried by the brake drum concentrically disposed with the axis of the cylindrical brake drum and having at least one hole therein radially disposed from said axis;

(b) second locking means carried by the gear box and movable between a first position non-slidably engaged with said first locking means to prevent rotation of the shaft and a second position disengaged from said first locking means so that the shaft is free to rotate, said second locking means including an engaging member adapted to pass through said hole to cause said non-sliding engagement; and

(c) a disengaging member disposed for engagement with said second locking means, said disengaging member including a handle for manually moving said disengaging member and a weighted member adapted to be moved by said handle to strike said second locking member to impart a force thereto tending to remove said engaging member from said hole.

4,275,610

INFINITELY VARIABLE TRACTION ROLLER TRANSMISSION

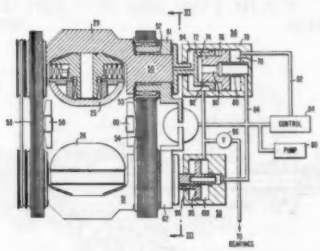
Charles E. Kraus, Austin, Tex., assignor to Excelermatic Inc., Austin, Tex.

Continuation of Ser. No. 10,367, Feb. 8, 1979, abandoned. This application Jan. 28, 1980, Ser. No. 116,044

Int. Cl.³ F16H *15/08, 15/26, 13/10*

U.S. Cl. 74—200 **10 Claims**

1. In combination with an infinitely variable traction roller transmission comprising: coaxial input and output shafts; oppositely disposed toric elements, one being supported by each of said shafts for rotation therewith and arranged to face each other; at least two motion transmitting traction rollers disposed between said toric elements in radial symmetry and for engagement therewith so as to transmit motion from one to the other of the toric elements; a pivotal support structure for each of said traction rollers with pivot bearings at opposite sides of the respective traction rollers such that said pivotal support structures together with said traction rollers are pivotal about an



axis normal to a plane which includes the axis of the input and output shafts; the improvement wherein at least one of said pivot bearings of each pivotal support structure is independently movably supported in such a manner as to permit relative movement thereof toward and away from the axis of the input and output shafts and means are provided for forcing said pivot bearings toward the axis of said input and output shafts for firm frictional engagement of said traction rollers with said toric elements.

4,275,611

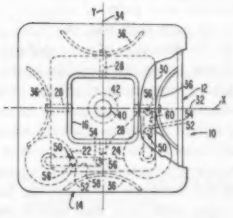
JOYSTICK CONTROLLER

James C. Asher, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Mar. 29, 1979, Ser. No. 25,122

Int. Cl.³ G05G *9/04;* **H01C** *10/16*

U.S. Cl. 74—471 XY **12 Claims**

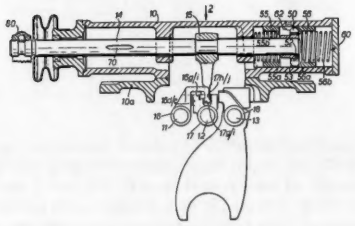


1. An X-Y controller comprising: a support; a pair of electrical components carried by the support, each component having a rotatable shaft; a plate mounted on the support for movement relative thereto in any one of a number of directions, said plate having a number of side margins; means engaging the side margins of the plate for biasing the plate into an equilibrium position relative to said support; a lever having a ball joint coupled with the plate and extending therethrough, one end of the lever being pivotally coupled to the support to permit movement of the plate relative to the support in a plane as the lever is pivoted about an axis through said one end of the lever; and crank means coupling each shaft, respectively, to the plate to permit rotation of the shaft as a function of the movement of the plate relative to said support.

4,275,612
SHIFT CONTROL FOR CHANGE SPEED GEAR TRANSMISSION FOR VEHICLE

Robert C. Silvester, Fleet, England, assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 15, 1978, Ser. No. 970,052
Claims priority, application United Kingdom, Mar. 30, 1978, 12419/78
Int. Cl.³ G05G 9/12, 5/00
U.S. Cl. 74—473 R 16 Claims

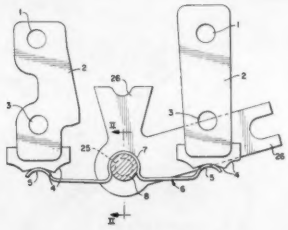


1. A shift control for compound change speed gear transmissions of the range type having a main transmission section and an auxiliary transmission section connected in series, said control comprising: a casing, a first and a second generally parallel shift rods each shiftable axially in the casing to select at least one gear ratio of the main transmission, a cross shaft mounted in said casing generally transversely of said shift rods for axial sliding movement to-and-fro in the direction of its longitudinal axis and for rotational movement in both directions about its longitudinal axis, a gear selector finger on the cross shaft and movable therewith, two pairs of selector finger engagement faces provided on each shift rod, the faces of each pair being spaced apart in the direction of axial shifting of the shift rods, the selector finger being displaceable in the direction of the longitudinal axis of the cross shaft for positioning between each pair of selector finger engagement faces and being pivotable about the axis of said cross shaft for selective engagement with one of said faces at a time of said pairs of faces to shift said shift rods, one pair of selector finger engagement faces on each shift rod disposed between the selector finger engagement faces on the other shift rod, and switch means operable in response to axial sliding of the cross shaft between one of its axial positions to engage said gear selector finger with one of said pairs of selector finger engagement faces on one shift rod and another axial position to engage said selector finger with one of said pairs of selector finger engagement faces on another shift rod, for shifting the auxiliary transmission, said pairs of selector finger engagement faces formed on first and second selector blocks mounted on the first and second parallel shift rods respectively, said pairs of faces defining a slot when all the shift rods are in their neutral positions in which slot the distal end of the selector finger is accomodated, the first and second selector blocks each formed with two slots intersecting at right angles, the slots extending parallel with the longitudinal axis of the cross shaft and the longitudinal axes of the shift rods respectively.

4,275,613
DETENT MECHANISM FOR THE DIFFERENT POSITIONS OF A CHANGE-SPEED TRANSMISSION, ESPECIALLY FOR MOTOR VEHICLES

Günter Wörner, Kernen, and Peter Schrape, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Apr. 17, 1979, Ser. No. 30,958
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1978, 2817168
Int. Cl.³ G05G 5/06
U.S. Cl. 74—475 7 Claims

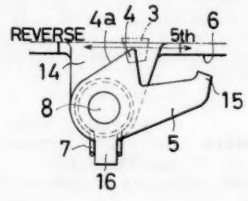


1. A detent mechanism for holding shifting means of a mechanical transmission gear system in respective different shifting positions, the shifting means including a pair of spaced shifting rocker arm means pivotable about a bearing means for shifting gear means of the transmission, and detent contour means provided on each of the rocker arm means adapted to be engaged by a resiliently flexible member, characterized in that a fixed bearing means is arranged between the pair of shifting rocker arm means, and in that the resiliently flexible member includes a flat spring means having a portion thereof resting on the fixed bearing means and having free ends thereof counterbearing on the detent contour means of the respective shifting rocker arm means.

4,275,614
APPARATUS FOR PREVENTING WRONG SHIFT OPERATION IN SPEED CHANGE GEAR FOR VEHICLE

Kiyokazu Okubo, Wako, and Hiroshi Nakayama, Kamifukuoka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 6, 1979, Ser. No. 100,875
Claims priority, application Japan, Dec. 12, 1978, 53/169833[U]; Dec. 12, 1978, 53/169834[U]; Dec. 12, 1978, 53/169835[U]
Int. Cl.³ G05G 5/04, 9/18
U.S. Cl. 74—476 10 Claims



1. In a shifting apparatus for a transmission of a vehicle having a shift lever operable left and right for travel to selection positions and front and rear for shifting gears, the shift lever being shiftable in one of the selection positions between a forward gear position and reverse position, projection means movable with said shift lever, a pivotal lock member posi-

tioned in the path of travel of the projection means in moving to said one selection position such that the lock member is pivoted from a neutral position to an inoperative position in which the shift lever is movable to said forward gear and reverse positions, spring means engaging said pivotal lock member for urging said lock member to said neutral position and opposing pivotal movement therefrom, said lock member including a claw which is positioned to engage said projection means when the shift lever has traveled to said forward gear position and is then moved towards said reverse gear position whereby said lock member then pivotably moves with the travel of said projection means, and stop means for limiting the pivotal movement of the lock member and preventing travel of the projection means and thereby of said shift lever to said reverse position, the improvement comprising pivot means supporting said lock member for pivotal movement about an axis extending parallel to the direction of travel of the projection means when the shift lever is moved in the selection direction, said projection means and lock member having opposed cam surfaces cooperatively engageable when the projection means contacts the lock member when the shift lever moves to said one selection position to pivot said lock member from said neutral position to said inoperative position.

4,275,615

DEVICE FOR MOUNTING LEVER ASSEMBLY ON HANDLE BAR

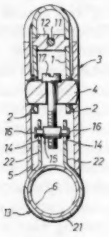
Toshiharu Yoshigai, Higashi-Osaka, Japan, assignor to Yoshigai Kikai Kinzoku Kabushiki Kaisha, Osaka, Japan

Filed Aug. 8, 1978, Ser. No. 931,885

Claims priority, application Japan, Oct. 6, 1977, 52/135367[U]

Int. Cl.³ B62K *23/06*; B62L *3/02*; G05G *7/00*

U.S. Cl. 74—489 **1 Claim**



1. A device for mounting a lever assembly on a handlebar for use in bicycles or motor cycles comprising a housing pivotably supporting an operating lever, a fastening band fittable around the handlebar to mount the housing on the handlebar, and a nut having an ear provided at each of its opposite ends and engaged in an aperture formed in each of the opposite ends of the fastening band, the nut being drawable into the housing by a bolt provided within the housing and in screw-thread engagement with the nut to fasten the band to the handlebar, the ear including a cylindrical shank projecting from each end of the nut and a flange formed at the outer end of the shank, the shank being formed in its length longer than the thickness of the band, the flange being elongated to a substantially rectangular form in a direction at right angles to the internally threaded portion of the nut, the length of the short sides of the substantially rectangular flange being equal to the diameter of the shank, and the aperture of the band substantially conforms to the shape of the flange and elongated to a substantially rectangular form longitudinal of the band, thereby when the shank of the nut is turned within the aperture to bring the internally threaded portion of the nut into alignment with the bolt, the band is engageable with the inside surface of the flange.

4,275,616

HYDRAULIC WHEEL DRIVE

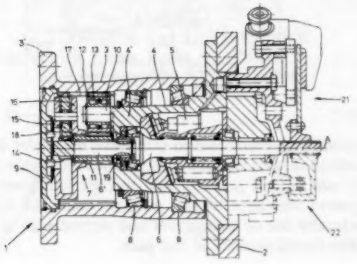
Friedrich Ehrlinger; Egon Mann; Manfred Fischer, all of Friedrichshafen, and Rudolf Jocham, Langenargen, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Oct. 3, 1978, Ser. No. 948,233

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1977, 2744936

Int. Cl.³ F16H *47/00*; B60K *1/00*; F16H *1/28*

U.S. Cl. 74—730 **12 Claims**



1. A wheel drive comprising:

a generally nonrotatable wheel support having a hollow projection;

a hydraulic motor mounted on said support at least partially in said projection and having an outwardly directed output shaft having an outer end;

a wheel hub supported solely and rotatable on said projection about a wheel axis, having an open outer side turned away from said motor, and formed internally with axially elongated teeth forming a ring gear centered on said axis;

an end plate extending generally perpendicular to said axis and releasably secured to said hub over said open outer side thereof, said plate forming at said axis a journal for said outer end of said output shaft;

at least one mounting pin integral with said projection and extending therefrom parallel to but offset from said axis, said pin having an inner end fixed at said projection and a free outer end;

a planet gear rotatable on said free end of said pin and meshing with said ring gear;

a sun gear rotatable about and centered on said axis and meshing with said planet gear; and

means operatively connecting said sun gear to said output shaft for driving said hub by said motor through said gears.

4,275,617

HYDRAULIC SYSTEM FOR A RATIO CHANGE TRANSMISSION

Ilmars Kalns, Northville, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 25, 1979, Ser. No. 51,575

Int. Cl.³ F16H *3/44*, *47/00*

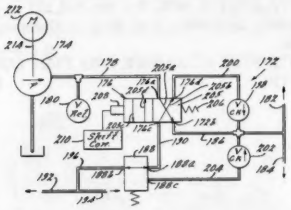
U.S. Cl. 74—750 R **11 Claims**

1. In a ratio change transmission including shift means operative in response to the absence of a pressurized oil to shift the transmission to one ratio and operative in response to the presence of a pressurized oil to shift the transmission to another ratio; and improved hydraulic system for effecting said absence and presence and for lubricating and cooling said transmission; the improvement comprising:

a pump for delivering an oil flow; valve means receiving said oil flow, said valve operative in a first position to effect said absence and operative in a second position to effect said presence;

a first path connected to said valve means for directing said

oil flow to said transmission for lubricating and cooling when said valve is in said first position, said path presenting a low resistance to said oil flow, whereby said pump delivers said oil flow at a relatively low pressure; and



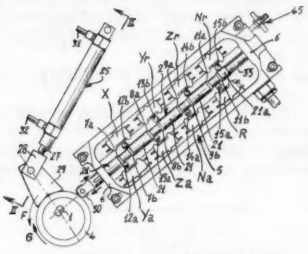
a second path connected to said valve means for directing said oil flow to said shift means when said valve means is in said second position, said second path presenting a greater resistance to said oil flow than said first path, whereby the oil pressure in said second path is greater than the oil pressure in first path.

4,275,618

CONTROL DEVICE FOR MOTOR ROAD VEHICLE AUTOMATIC CHANGE-SPEED TRANSMISSION MECHANISM

Alain Bale, Le Mans, France, assignor to C.B.M. Car et Bus Le Mans, Le Mans, France

Filed Dec. 18, 1979, Ser. No. 104,902
Claims priority, application France, Jan. 4, 1979, 79 00141
Int. Cl.[3] B60K *41/06, 20/08*
U.S. Cl. 74—878 **9 Claims**



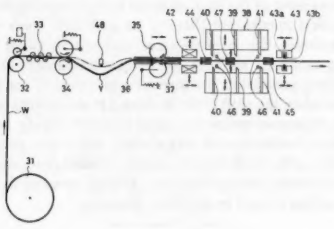
1. A motor road vehicle automatic change-speed transmission mechanism control device comprising means for pivoting a gear selector shaft in order to bring said gear selector shaft to various positions corresponding to a selected range of gear ratios, wherein said means comprise a shaft for detecting the positions assigned to said selector shaft, electro-pneumatic means for controllably moving said detector shaft to the desired position, a control keyboard adapted to be mounted on the instrument panel of the vehicle, a rotary cam rigid with said selector shaft and adapted to engage with its profile one end of said detector shaft, a radial arm rigid with said cam and operatively connected to said electro-pneumatic means, whereby when a key of said control keyboard is depressed said electro-pneumatic means are actuated so as to move said detector shaft in translation, said cam and said selector shaft for pivotal movement to a position determining the operation of the mechanism through the selected range of gear ratios.

4,275,619

ROLLER FEED TYPE INSULATED WIRE CUTTING AND INSULATION STRIPPING MACHINE

Akira Shimizu, Amagasaki, Japan, assignor to Shin Meiwa Industry Co., Ltd., Nishinomiya, Japan

Continuation-in-part of Ser. No. 886,950, Mar. 15, 1978, abandoned. This application May 17, 1979, Ser. No. 39,856
Claims priority, application Japan, Mar. 25, 1977, 52-7733632; Mar. 25, 1977, 52-7733633
Int. Cl.[3] H02G *1/12*
U.S. Cl. 81—9.51 **4 Claims**



1. A roller feed type insulated wire cutting and insulation stripping apparatus, comprising a feed mechanism and a cutting and stripping mechanism, said feed mechanism serving to intermittently feed an insulated wire drawn from a wire supply source toward said cutting and stripping mechanism according to desired length-measuring conditions, said cutting and stripping mechanism serving to cut the thus fed wire and strip the insulation from the cut wire end, wherein said feed mechanism comprises the following elements: a pair of first feed rollers disposed downstream of said wire supply source and continuously driven and variable in speed, a pair of second feed rollers disposed downstream of and spaced at a predetermined distance from said pair of first feed rollers, said second feed rollers comprising length measuring means and being intermittently driven according to desired length measuring conditions, with a section being defined between said first and second feed rollers where said insulated wire is forced to slack, and slack detecting means installed for cooperation with said wire slack section for detecting a predetermined minimum or maximum amount of slack in said wire slack section to produce a signal for accelerating or decelerating said pair of first feed rollers for a fixed period of time, said cutting and stripping mechanism comprising a group of cutting blades disposed downstream of and spaced a predetermined distance from said pair of first feed rollers, said group of cutting blades comprising a pair of opposed wire cutting blades, and pairs of first and second insulation cutting and stripping blades disposed upstream and downstream of said wire cutting blades, respectively, and juxtaposed with and opposed to said wire cutting blades, the arrangement being such that the opening and closing action of said cutting blades effects the cutting of the insulated wire and of the insulation on both sides of the position at which said insulated wire has thus been cut, and first and second movable clamps separately movable in the direction of the wire, said movable clamps serving to strip the insulation on both sides of said cut position of the wire when they are moved away from each other and from said cutting blades while clamping the wire during the closing of said cutting blades group, said apparatus further comprising a wire guiding device which can be opened and closed, said wire guiding device being disposed between said pair of wire cutting blades and said first insulation cutting and stripping blades, said wire guiding device being arranged so that it changes from its closed to its opened state from the time just prior to said group of cutting blades starting its closing operation until the time it completes its closing operation and it also changes from its opened to its closed state from the time when said movable clamps start to return upon comple-

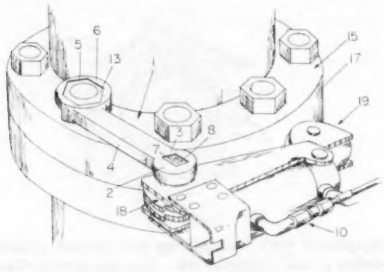
tion of said insulation stripping until the time just prior to the completing of said return movement of said movable clamps.

4,275,620

TORQUE ARM FOR USE WITH A TORQUE WRENCH

Bobby W. V. Collins, P.O. Box 15034, Baton Rouge, La. 70895

Filed May 21, 1979, Ser. No. 40,545
Int. Cl.³ B25B *13/46*
U.S. Cl. 81—57.39 **3 Claims**



1. A torque arm attachable to a drive axle of a torque wrench and fittable about a nut or bolt head to rotate same which comprises:

(a) an arm member having a straight center line and provided with a flat underside,

(b) a sprocket head attached at one end of the arm member and having a cavity extending throughout perpendicular to the arm member under side, and shaped to matingly receive the torque wrench drive axle, the center of the cavity being aligned with the arm member center line and the bottom of the sprocket head being in the same plane formed by the arm member underside,

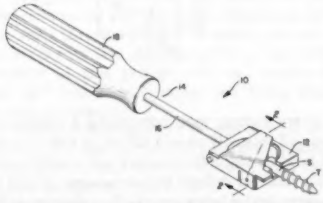
(c) a head member attached at the opposite end of the arm member and having an opening extending throughout perpendicular to the arm member under side and shaped to matingly receive the nut or bolt head, the center of the opening being offset from the arm member center line, and a portion of the bottom of the head member extending below the plane formed by the arm member under side.

4,275,621

IMPLEMENT FOR ATTACHING HANGERS

Louis J. Mallott, Sr., P.O. Box 64, Linden, Pa. 17744

Filed Oct. 5, 1979, Ser. No. 82,306
Int. Cl.³ B25B *13/28*
U.S. Cl. 81—111 **11 Claims**



1. An implement for attaching hangers of the type such as screw eyes, screw hooks and the like to surfaces comprising:

a body for holding the hanger having a screw end for penetration into the surface,

handle means attached to said body for rotation of said body and penetration of said screw end into said surface,

a cover pivotally secured at one end to said body to releasably secure said hanger within said body,

securing means releasably acting between said cover and said body to retain said cover in position to secure said hanger within said body,

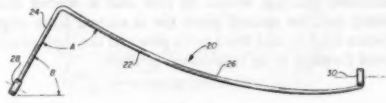
a contact activator positioned on said implement operably connected to said securing means to release and pivot said cover away from said securing means upon said contact activator contacting said surface whereby said hanger is disengaged from said implement.

4,275,622

DUAL WHEEL VALVE STEM TOOL

Willie Ford, 3531 S. Ewing, Dallas, Tex. 75216

Filed Apr. 24, 1979, Ser. No. 32,765
Int. Cl.³ B25B *13/00*
U.S. Cl. 81—125.1 **7 Claims**



1. A manual tool adapted to engage a valve stem retainer nut on the inside wheel of a dual wheelset without removal of the outside wheel, which comprises:

a rigid shaft having two ends;

said shaft including an arcuate portion and a substantially straight portion lying in a common plane and joined at a predetermined angle; and

a nut-engaging member rigidly secured to each end of said shaft for engaging the valve stem retainer nut, each member having a longitudinal axis lying in said common plane and extending at a predetermined angle transverse to its corresponding shaft portion;

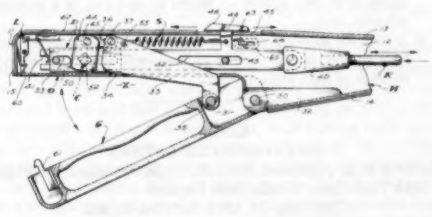
the nut-engaging member on the end of the straight portion of said shaft having a transverse plane extending therethrough which subtends the straight shaft portion with the longitudinal axis of said member being oriented substantially perpendicular to the straight shaft portion.

4,275,623

HAND TOOL

James Walter, 3110 Park Newport, Apt. 209, Newport Beach, Calif. 92660

Filed Nov. 13, 1979, Ser. No. 93,688
Int. Cl.³ B25B *13/12*
U.S. Cl. 81—126 **12 Claims**



1. A hand tool comprising an elongate housing having a front end portion, a central portion and a rear handle portion, a work-engaging head secured to and projecting from the front end portion of the housing and including stationary and movable work engaging parts, an elongate tension rod extending through the central portion and between the front end and rear handle portions of the housing, means drivingly coupling a movable part of the head with the front end of the rod, manu-

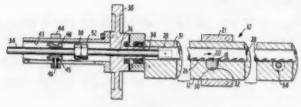
ally operable operating means to selectively move the rod longitudinally from an unactuated forward position to an actuated rear position and to cause the head to work on a piece of work engaged with and between parts thereof, said operating means includes an elongate manually engageable finger grip with front and rear ends, a first pivot pin pivotally mounting the front end of the grip with the housing at the front end of the handle portion, an elongate lever arm with a rear end and a front end, a second pivot pin pivotally connecting the front end of the lever arm with the grip on an axis spaced rearward from the axis of the first pivot pin, a third pivot pin carried by the rear end of the lever arm on an axis spaced rearward from the axis of the second pivot pin, and drive means between the rear end of the rod and the third pivot pin, said grip is manually pivotally movable about the axis of the first pivot pin from an actuated position where it is substantially parallel with and adjacent said handle portion and where said first, second and third pivot pins are in substantial alignment with each other and said third pivot pin is in a rear actuated position to an unactuated position where its rear end is spaced from the housing and the second pivot pin is moved from alignment between the first and third pivot pins and the third pivot pin is moved forward to an unactuated position.

4,275,624

INTERNAL ADJUSTABLE GROOVING BAR

John T. Murray, San Jose, Calif., assignor to United Centrifugal Pumps, San Jose, Calif.

Filed Oct. 12, 1979, Ser. No. 84,089
Int. Cl.³ B23B *41/00, 51/00*
U.S. Cl. 82—1.2 **7 Claims**



1. A grooving bar for machining an internal groove on a work piece comprising in combination:

a. an elongated bar adapted to be held within a cavity of a work piece and revolved therein;

b. a tool holder and tool adapted to turn with said bar, said tool holder being slideably mounted in a radial passage within said bar;

c. a draw bar movable within an eccentric passage in said elongated bar axially of said grooving bar and at right angles to said tool holder;

d. mating teeth on said draw bar and said tool holder whereby movement back and forth on said draw bar will cause said tool holder to move in and out in a positive manner, and

e. means for moving said draw bar in and out to bring said tool holder in and out of engagement with the interior surface of said work piece.

4,275,625

MULTI-SPINDLE LATHES

Geoffrey E. S. Tomlinson, Solihull, England, assignor to White-BSA Tools Ltd., Birmingham, England

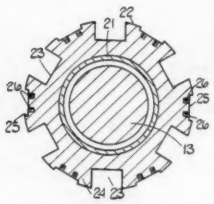
Filed May 22, 1979, Ser. No. 41,482
Claims priority, application United Kingdom, May 24, 1978, 22138/78
Int. Cl.³ B23B *21/00, 3/34, 29/00*
U.S. Cl. 82—25 **11 Claims**

7. A tool slide assembly comprising:

(a) a body having a circular cylindrical external surface divided into a plurality of convex part-circular cylindrical portions by grooves of substantially rectangular cross-section which open onto said external surface at spaced intervals therearound, adjacent side walls of each pair of adjacent grooves being mutually inclined;

(b) a plurality of dovetail-section rails provided on said body, each said rail being formed by a respective one of said convex part-circular cylindrical portions and said mutually inclined adjacent side walls of the respective pair of adjacent grooves; and

(c) at least one tool holder for mounting on a respective rail, said at least one tool holder including a body, a concave part-circular cylindrical locating surface on said body for



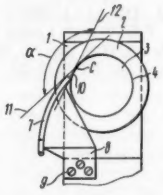
engagement with said convex part-circular cylindrical portion of said respective rail, a first side member fixed to said body and extending beyond said locating surface at one end thereof, and a second side member adjustably mounted on said body and extending beyond an opposite end of said locating surface, said first and second side members being engageable respectively with said adjacent side walls of said respective rail, adjustment of said second side member relative to said body serving to clamp said at least one tool holder to said respective rail.

4,275,626

ROTARY CUTTING TOOL

Lev A. Gik, ulitsa Elblongskaya, 13, kv. 16, Kaliningrad, U.S.S.R.

Filed Dec. 13, 1979, Ser. No. 103,367
Int. Cl.³ B23B *29/00*; B26D *1/00*
U.S. Cl. 82—36 R **2 Claims**

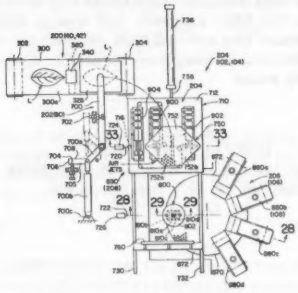


1. A rotary cutting tool, comprising a holder, a working head mounted rotatably on said holder, at least one edge of said working head having a face surface and a relief surface, and a cutting lip which is defined by intersection of said surfaces, a chip-breaking device being essentially a plate made fast on said holder in such a manner that one of its edges crosses the cutting lip of said tool edge and is located as close as possible to the face surface thereof with the provision for said working head to freely rotate, while the plate itself is inclined towards the surface of said edge at an angle which provides for chip disposal from the cutting zone.

4,275,627
APPARATUS FOR CUTTING CIGAR WRAPPERS FROM NATURAL TOBACCO LEAVES

Verner Anderson, Berwick, Pa.; David J. Logan, Glastonbury, and Kenneth O. Wood, Ellington, both of Conn., assignors to Gulf & Western Corporation, New York, N.Y.

Division of Ser. No. 902,262, May 2, 1978, Pat. No. 4,222,396.
This application Aug. 29, 1979, Ser. No. 70,867
Int. Cl.[3] A24C 1/04
U.S. Cl. 83—152 4 Claims



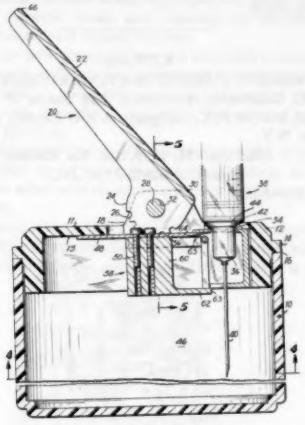
1. An apparatus for cutting a selected one of a plurality of cigar wrappers from a natural tobacco leaf comprising: means for supporting said leaf in a spread condition on a generally flat cutting surface; a cutting member having a plurality of cutters each with a cutting profile corresponding to one of said plurality of cigar wrappers; means for capturing a cut wrapper onto a cutter as it cuts said wrapper from said leaf; means for moving said support means in at least two orthogonal directions until a selected portion of said leaf is aligned with a particular one of said cutters; means for forcing said cutting member perpendicularly toward said flat cutting surface; and, means for shifting said particular cutter with respect to said cutting member to an extended cutting position.

4,275,628
SYRINGE AND NEEDLE DESTROYER

Hyman D. Greenhouse, Cranbury Post Office, Main St., Cranbury, N.J. 08512

Filed Oct. 31, 1979, Ser. No. 89,914
Int. Cl.[3] B26D 5/10; B23D 15/00
U.S. Cl. 83—167 3 Claims

1. A syringe and needle destroyer comprising:
a receptacle into which a distal end portion of said syringe and said needle drop after being severed;
a base including a cover fitted onto said receptacle;
means positioned on said base for orienting said distal end portion of said syringe and said needle in a plain perpendicular to a plane of said base, said means for orienting including said cover and said cover having an operating opening and a shoulder portion, a middle portion of said syringe resting on said shoulder portion, and said distal end portion of said syringe and said needle passing through said operating opening and being suspended within said receptacle;
severing means movably mounted on said base on an underside of said cover and movable in a horizontal plane parallel to said plane of said base for severing both said distal end of said syringe and said needle;
a handle movably mounted on said cover of said base for rotation about an inner end of said handle; and
means for mechanically linking said handle and said severing means, such that movement of said handle in a plane perpendicular to said plane of said base causes movement of said severing means, said means for mechanically linking including at least one projection positioned on said inner end of said handle and at a right angle to an axis of said handle, extending through an opening in said cover,

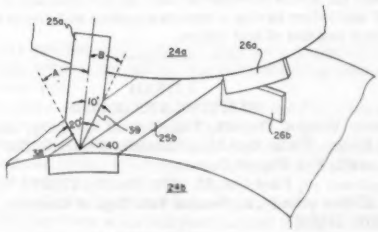


and cooperating with a respective opening in said severing means.

4,275,629
SEPARATOR-CUTTER

Jerry T. McDowell, Greenville, Tenn., assignor to Ball Corporation, Muncie, Ind.

Filed Jul. 25, 1979, Ser. No. 60,531
Int. Cl.[3] B23D 25/12; B26D 1/56
U.S. Cl. 83—302 1 Claim



1. An apparatus for cutting individual battery grids from a continuous sheet of pasted grid stock having an overlayer and underlayer of webbing material including paper comprising a first rotatably mounted cylinder having a cutting pattern including first cutter means lying transverse to the longitudinal axis of said first cylinder and cutting knives spaced from each other and from said first cutter means and lying parallel to the longitudinal axis of said first cylinder, each cutting knife having two adjacent cutting faces terminating into the cutting edge thereof, the angular slope of said cutting faces is about 20° for the leading edge and about 10° for the trailing edge thereof, and a second rotatably mounted cylinder spaced from said first cylinder and having second cutter means cooperating with said first cutter means to cut lengthwise of said sheet, said second cylinder having anvil members secured along the periphery thereof and disposed to come into substantial alignment during rotation adjacent said cutting knives and spaced therefrom to make direct contact therewith, the surface hardness of said cutting knives and said anvil members being different, said cutting knife being between about 55 to 65 Rockwell hardness on the C scale and said anvil members having between about

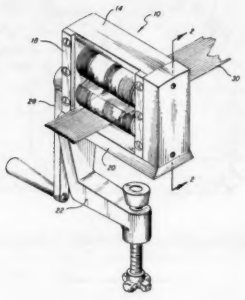
50 to 65 Rockwell hardness on the C scale, said cutting knives and anvil members cooperating together to sever the sheet including the overlayer and underlayer of webbing material including paper.

4,275,630

APPARATUS FOR SEPARATING RIBBON CABLE

Arthur C. Goldsmith, LaFayette, and James P. Kirkgasser, DeWitt, both of N.Y., assignors to K-G Devices Corporation, Dewitt, N.Y.

Filed Dec. 26, 1979, Ser. No. 106,846
Int. Cl.³ B26D *1/24, 3/12*
U.S. Cl. 83—500 **4 Claims**



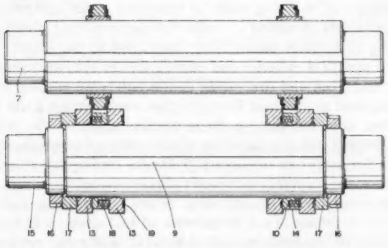
1. An apparatus for separating individual conductors of a multi-conductor ribbon type electrical cable comprising in combination first and second roller members in fixed parallel relation to each other, each having a plurality of parallel annular teeth having concave outer ends and at least one undercut sidewall, spacing between adjacent teeth being at least as great as the width of the teeth, the teeth on one roller being aligned with the spaces between the teeth on the other and at least one of said rollers having a truncated portion and means for reciprocal rotation of said rollers.

4,275,631

SLITTING APPARATUS

Peter Wingen, Overath, Fed. Rep. of Germany, assignor to Dienes Werke fuer Maschinenteile GmbH & Co. KG, Overath, Fed. Rep. of Germany

Filed Oct. 23, 1979, Ser. No. 87,697
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1978, 2846747
Int. Cl.³ B26D *1/24*
U.S. Cl. 83—501 **12 Claims**



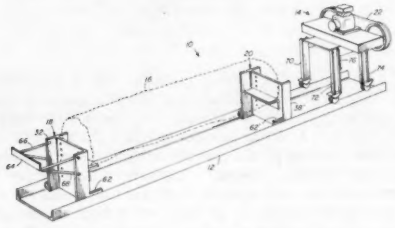
1. Slitting apparatus comprising: a pair of spaced parallel shafts having cooperating knife means thereon, said knife means on one said shaft comprising a hub mounted on said one shaft for rotation therewith and for axial movement relative thereto, a pair of flat circular knife rings mounted on said hub in axially-spaced relationship to one another and being elastically yieldable axially of said shafts, said knife means on the other of said shafts including a pair of axially-spaced circular knife members mounted on said other shaft and having opposed substantially flat facing surfaces spaced-apart for close reception of said knife rings therebetween, releasable clamping means for mounting said knife members to said other shaft against axial movement relative thereto and being releasable for providing axial movement of said knife members relative to said other shaft and to one another for increasing the axial spacing between said facing surfaces of said knife members to place said knife rings therebetween, a spacer ring on said other shaft between said knife members, and springs interposed between said spacer ring and said knife members for moving said knife members axially away from one another upon release of said clamping means.

4,275,632

PORTABLE SAWMILL

Warren K. Ross, Main St., W. Hampstead, N.H. 03841

Filed Sep. 19, 1979, Ser. No. 76,905
Int. Cl.³ B27B *5/00*
U.S. Cl. 83—794 **7 Claims**



1. A portable sawmill, comprising
(a) an elongated straight rigid bed adapted to be placed on a generally level supporting surface with one end thereof elevated slightly above the opposite end thereof,
(b) a pair of height adjustable supports mountable to said bed for supporting opposite ends of a log placed thereon lengthwise of said bed,
(c) at least one of said log supports being movable lengthwise of said bed to accommodate logs of different lengths, and
(d) a carriage mountable to said bed for straight line movement along the length thereof, said carriage being mounted on rollers engaging said bed whereby when said carriage is located at the elevated end of said bed it will roll by gravity to the opposite end thereof,
(e) a power driven band saw having a horizontal cutting reach mounted to said carriage and adapted to make a longitudinal cut through a log placed on said log supports during a lengthwise pass of said carriage.

4,275,633

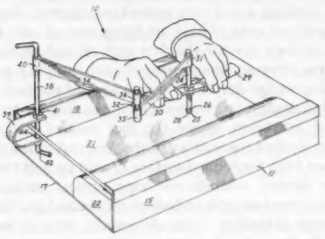
APPARATUS FOR PRODUCING LEADED GLASS ARTICLES

John J. Littlehorn, Jr., 4530 S. Broadway, Englewood, Colo. 80110

Filed Dec. 13, 1978, Ser. No. 969,081
Int. Cl.³ B26D *3/08*
U.S. Cl. 83—886 **4 Claims**

1. Apparatus for cutting sheet glass to desired shapes for producing leaded glass articles, said apparatus comprising: a horizontally traversing arm assembly comprised of two substantially identical bar components operatively connected to each other; a clamp cooperatively connected to one bar component of the arm assembly; a stylus cooperatively connected

to the other bar component of the arm assembly; a replaceable cutter on the lower end of said stylus; and a wing-like handle mounted on said stylus, said wing-like handle extending later-



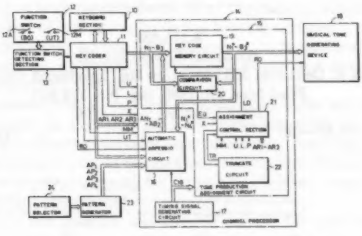
ally away from said stylus and parallel to sheet glass being cut by said cutter, whereby a user can balance the stylus with the wing-like handle so that forces on the cutter can be maximized along the axis of the stylus.

4,275,634

ELECTRONIC MUSICAL INSTRUMENT WITH AUTOMATIC ARPEGGIO FACULTY

Akio Imamura; Eiichi Yamaga, and Akira Nakada, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 7, 1979, Ser. No. 92,082
Claims priority, application Japan, Nov. 10, 1978, 53-138594
Int. Cl.³ G10H *1/28, 5/00*
U.S. Cl. 84—1.03 **12 Claims**



1. In a polyphonic keyboard electronic musical instrument of the type in which musical tones are produced in a tone generator having a number of tone production channels considerably fewer than the number of keyboard keys, each channel producing a tone established by a key code supplied thereto, the improvement for arpeggio tone production wherein:

more than one of said tone production channels are dedicated only to the production of arpeggio tones, together with: automatic arpeggio circuit means for selectively supplying arpeggio tone designating key codes sequentially or simultaneously to respective different ones of said dedicated tone production channels at consecutive arpeggio tone production times.

4,275,635

ACCORDION WITH A NEW ORDER OF SOUNDS AND MECHANICAL REED OPENING SYSTEM

Petar Maric, 3, Djure Jaksica, Pancevo, Yugoslavia (26000)

Filed Aug. 14, 1979, Ser. No. 67,619
Int. Cl.³ G10D *11/02*
U.S. Cl. 84—376 R **3 Claims**

1. A sound chamber for an accordion comprising:

a sound chamber frame,

a plurality of classical reeds attached to said frame,

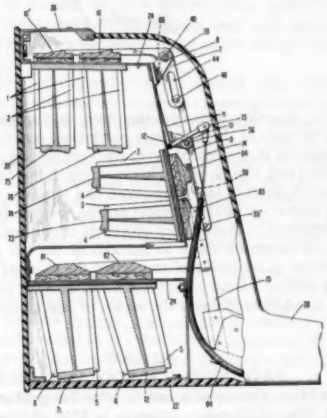
a plurality of classical pallets positioned over said plurality of classical reeds to selectively open and close said plurality of classical reeds, said plurality of classical pallets being biased to a closed position,

at least one new sound order reed attached to said frame,

a new sound order pallet, positioned over said new sound order reed to selectively open and close said new sound order reed, said new sound order pallet being biased to a closed position,

a classical key lever connected to said plurality of said classical pallets to selectively move said pallets to an open position when said classical key lever is placed in the play position,

an L-shaped new order key lever pivotably connected to said frame to selectively move said new order pallet to an open position when said new order key lever is placed in



the play position, said L-shaped lever being connected to said new order sound pallet at one end and having a slot at the other end,

a pivot support connected to said frame and capable of being placed in an up or down position,

a flat transmission lever pivotably connected to said pivot support and having a first pin protruding through said slot of said L-shaped lever and having a second pin overlapping said classical key lever to contact and move with said classical key lever when said pivot support is placed in the down position and said classical key lever is moved to the play position, and

means for selectively placing said pivot support in an up or down position, whereby when said pivot support is in the down position, the movement of the classical key lever to the play position causes the pivoting of the flat transmission lever and the corresponding pivoting of said L-shaped lever to the play position.

4,275,636

TIES FOR THE MOUTHPIECE OF A WIND INSTRUMENT

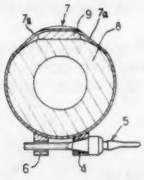
Bernard M. Van Doren, Saint Germain En Laye, France, assignor to Ets Van Doren, France

Filed May 29, 1979, Ser. No. 43,510
Claims priority, application France, Oct. 3, 1978, 78 28230
Int. Cl.³ G10D *9/02*
U.S. Cl. 84—383 R **7 Claims**

1. A flexible tie made from a deformable material, for the mouthpiece of a wind instrument, comprising two split ring-shaped parts, disposed respectively in a plane perpendicular to the axis of the tie and fitted with assembly means capable of

drawing together their opposing ends, said tie being characterized in that each of said rings comprises, on its internal face, perpendicularly to the axis of the tie, a projecting curvilinear, arcuate stamped part which contacts along all of its length the external convex part of the reed of a wind instrument fitted with the tie, when said rings are deformed under the action of said assembly means.

4. A flexible tie made from a deformable material, for the mouthpiece of a wind instrument, comprising two split ring-shaped parts, disposed respectively in a plane perpendicular to the axis of the tie and fitted with assembling means capable of



drawing together their opposing ends, said means for assembling the ends of the split rings comprising screws engaged in a projection at one end of a ring and cooperating with a nut at the other end, this tie being characterized in that the part of the screws engaged in said projections and the associated part of said projections have a conical profile, said tie further being characterized in that each of said rings comprises, on its internal face, perpendicularly to the axis of the tie, a projecting curvilinear part capable of contacting the external convex part of the reed of a wind instrument fitted with the tie, when said rings are deformed under the action of said assembly means.

4,275,637

FASTENING ELEMENT ASSEMBLY

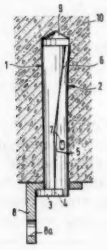
Armin Herb, Peissenberg, and Gusztav Lang, Munich, both of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Jul. 2, 1979, Ser. No. 53,953

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1978, 2829158

Int. Cl.³ F16B *13/04*

U.S. Cl. 411—78 **11 Claims**



1. An axially elongated fastening element assembly for insertion into a prepared borehole having a transverse shape generally conforming to the transverse shape of said fastening element assembly, comprising a tie bolt and an expanding wedge each elongated in the axial direction of the fastening element, said tie bolt and expanding wedge each having a first end which is inserted first into the borehole and a trailing second end, each of said tie bolt and expanding wedge having a first axially extending surface forming a part of the exterior circumferential surface of the fastening element and a second axially extending surface located interiorly of the circumferential surface of the fastening element assembly and forming the contacting surfaces of said tie bolt and expanding wedge, said tie bolt and expanding wedge each having an axially extending wedging part extending from the first end thereof toward the second end and a second part extending from the trailing end of said wedging part to the second end thereof, the transverse cross-sectional area of said wedging part of said tie bolt increases in area toward the first end of said tie bolt and the transverse cross-sectional area of said wedging part of said expanding wedge decreases in area toward the first end of said expanding wedge, said tie bolt and expanding wedge having an upspread condition where the first end of said expanding wedge is located rearwardly of the first end of the tie bolt and in contact with the second surface of said tie bolt on the wedging part thereof, wherein the improvement comprises that a flange is formed on said tie bolt on the second end thereof with said flange extending circumferentially around and radially outwardly from the first surface of said tie bolt, said flange being approximately C-shaped in a plane extending transversely of the axial direction of the fastening element assembly, said C-shaped flange having a pair of ends each extending outwardly from said tie bolt in the circumferential direction of the first surface thereof at the second end of said tie bolt, in the unspread condition the second end of said expanding wedge is spaced axially outwardly from the second end of said tie bolt, the parts of said flange extending circumferentially outwardly from said tie bolt being in surface contact with the exterior circumferential surface of said wedging part and form guides for said expanding wedge as said expanding wedge is displaced axially inwardly into the borehole relative to said tie bolt, and in the unspread condition the first surfaces of said tie bolt and expanding wedge form a continuation of one another so that the first surfaces of the parts of said tie bolt and expanding wedge disposed in contact with one another in the unspread condition are symmetrical about the axis of the fastening element assembly.

4,275,638

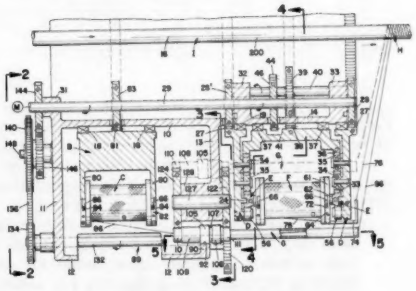
BRAIDING MACHINE

Simon A. DeYoung, 5132 Mayview Rd., Lyndhurst, Ohio 44124

Filed Mar. 10, 1980, Ser. No. 128,869

Int. Cl.³ D04C *3/42, 3/06*

U.S. Cl. 87—48 **14 Claims**



1. A braiding machine comprising in combination:

a. a generally cylindrical inner frame member having an axis;

b. a generally cylindrical outer frame member coaxial with at least one end of said inner frame member;

c. an end frame member supporting said outer frame member relative to said inner frame member;

d. an intermediate frame member spaced from said end frame member and extending radially outwardly from said inner frame member toward said outer frame member;

e. an outer carrier member in the space defined by said frame members and rotatable in a first direction on said axis, said outer carrier member having means for holding at least a bobbin having strands to be braided;

f. said intermediate frame member having a plurality of equally and circumferentially spaced, generally semi-cylindrical, radially outwardly facing bearing surfaces;
g. said outer frame member having an equal number of equally and circumferentially spaced, semi-cylindrical, radially inwardly facing bearing surfaces at least adjacent to the radial plane of said outwardly facing bearing surfaces and circumferentially offset therefrom by one-half the spacing therebetween;
h. the radius of curvature of said surfaces being the same with the centers of curvature being equally spaced from said axis and being dimensioned such that the ends of said semi-cylindrical surfaces overlap in a radial direction a predetermined amount;
i. an equal number of inner gears rotatably supported on said intermediate frame member, one midway between each pair of the outwardly facing bearing surfaces and on the center of curvature of each inwardly facing bearing surface;
j. an equal number of outer gears rotatably supported on said outer frame member, one midway between each pair of inwardly facing bearing surfaces and on the center of curvature of an outwardly facing bearing surface, all of said gears having a diameter such as to mesh with an adjacent gear;
k. each gear having a notch in its outer surface with the notches so circumferentially oriented that the notches of adjacent gears will mate as the gears rotate;
l. an inner carrier member rotatable on said axis in said first direction and having an equal number of circumferentially spaced, radially extending slots through its outer surface forming an equal number of toothed portions with the base of each slot being at least radially inwardly of the radially innermost portion of said outwardly facing bearing surfaces and the outer ends of said toothed portions being at least radially inwardly of the radially outermost portions of said inwardly facing bearing surfaces;
m. each toothed portion having, between its radial inner and outer ends, an arcuate bearing surface having a center of curvature on said axis;
n. a plurality of circumferentially spaced slide members rotatable in a second circumferential direction on said arcuate bearing surfaces and alternately bridging and opening said slots as the members rotate, each of said slide members having means for supporting a bobbin containing strands to be braided;
o. means for rotating said outside carrier and said inside carrier members in said first direction at the same rotational speed;
p. means for rotating said slide members in said second direction at an equal rotational speed;
q. means for rotating said gears at a third rotational speed such that the notches of the inner gears when radially inside of said circle are in generally axial alignment with respective ones of said slots;
r. an equal number of circumferentially spaced eyelet members extending from at least the side of said intermediate frame member adjacent said outer carrier member axially beyond the far end of bobbins on said inner support member, each of said eyelet members having portions adapted to fit snugly in the notches of said gears and having bearing surfaces alternately engage said inwardly facing and then said outwardly facing bearing surfaces;
s. strands from each bobbin on said outside carrier adapted to be guided through said eyelet member past said inside carrier and then radially inwardly generally to said axis;
t. means carrying strands from each of said inside bobbins axially past the end of said inside carrier such that said strands may move radially inwardly generally to said axis; and,
u. said eyelet member moving from a point radially outwardly of one inside carrier bobbin to a point radially inwardly of an adjacent inside carrier bobbin and then radially outwardly of a still further adjacent inside carrier bobbin.

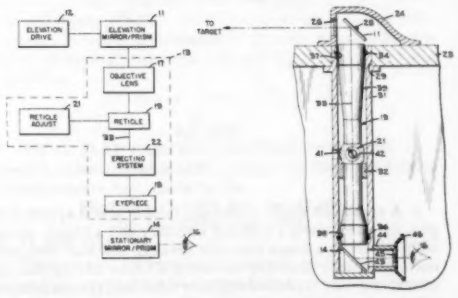
8. A braiding machine comprising in combination:
a. a generally cylindrical inner frame member;
b. a generally cylindrical outer frame member coaxial with at least one end of said inner frame member;
c. an end frame member supporting said outer frame member relative to said inner frame member;
d. an intermediate frame member spaced from said end frame member and extending radially outwardly from said inner frame member towards said outer frame member;
e. an inner carrier member supported for rotation on an axis in a first circumferential direction on said inner frame member on the side of said intermediate frame member remote from end frame member, said inner carrier member having a plurality of circumferentially spaced, radially extending slots through its outer surface forming an equal number of toothed portions therebetween, each toothed portion having between its radially inner and outer ends an arcuate bearing surface having a center of curvature on said axis;
f. a plurality of circumferentially spaced slide members movable on said bearing surfaces in a second circumferential direction and alternately bridging and clearing said slots; each of said slide members having means for supporting an inner bobbin containing a strand to be braided;
g. an outer carrier member between said end and intermediate frame members and rotatable in said first direction on said axis, said outer carrier member having means for holding at least an outer bobbin having a strand to be braided;
h. a plurality of tubular members each of an axial length greater than the axial length of said inner carrier member and the bobbins thereon, each extending axially past said inner carrier member and the bobbins supported thereon, each tubular member being axially aligned with a slot; and,
i. means moving each tubular member radially inwardly and outwardly through its respective slot when a slide member clears the slot, and circumferentially under and then over adjacent bobbins and their slide members as said slide members bridge their respective slots.

4,275,639

PERISCOPIC SIGHT WITH A UNITARY LENS SYSTEM

Arnold L. Garber, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Oct. 23, 1978, Ser. No. 953,995
Int. Cl.³ F41G 1/40
U.S. Cl. 89—41 E **7 Claims**



1. A periscopic sight, comprising
a unitary sealed lens system having a generally vertical lens axis extending therethrough,

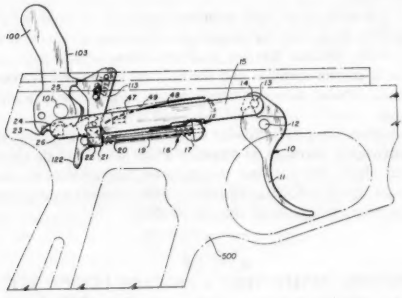
optically positive objective, erector and eyepiece lens groups aligned on said lens axis,
said lens system having a magnification power greater than one and providing maximum eye relief dimension attainable from said lens groups,
a top reflector optically exposed to objects to be sighted and aligned to intercept an upper end of said lens axis,
a top enclosure surrounding said top reflector,
a bottom reflector optically exposed to an observer position and aligned to intercept a lower end of said lens axis,
a bottom enclosure surrounding said bottom reflector,
said bottom reflector being spaced from the lower end of said sealed lens system and being positioned within said eye relief dimension,
an upper moisture impervious seal disposed between adjacent surfaces of said top enclosure and said sealed lens system,
and a lower moisture impervious seal disposed between adjacent surfaces of said bottom enclosure and said sealed lens system, whereby moisture from the surrounding environment is prevented from collecting on the external surfaces of said objective and eyepiece lens groups and said top and bottom reflectors.

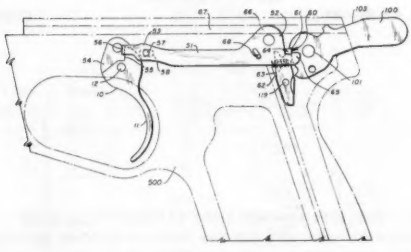
4,275,640

SEMIAUTOMATIC HAND GUN

Gary Wilhelm, Hamden, Conn., assignor to Llama Gabilondo y. Cia. S.A., Spain

Filed Oct. 20, 1978, Ser. No. 951,967
Int. Cl.[3] F41C *19/14*
U.S. Cl. 89—147 **10 Claims**





1. A combined single action and double action system for a gun, the gun having a hammer assembly and a trigger pivotal with respect to a frame assembly between rest and firing positions, the frame assembly including a frame having first and second spacially separated opposite sides, said system comprising:

double action bar means, said double action bar means including an elongated member having first and second ends, the first end of said double action bar means elongated member being connected to the trigger to provide for movement of said double action bar means when the trigger is pivoted from the rest position toward the firing position, said double action bar means elongated member being positioned adjacent a first side of the frame;

the hammer including a first recess on the side thereof adjacent said double action bar means, said hammer first recess defining a camming surface;

the second end of said double action bar means elongated member including a camming protrusion which engages the first recess defined camming surface on the hammer, movement of the trigger being coupled to the hammer by said double action bar means to provide for pivoting of the hammer from the rest position to the firing position, said camming protrusion moving out of engagement with the camming surface after a preselected amount of movement of the trigger to allow for release of the hammer;

single action bar means, said single action bar means including an elongated member having first and second ends, a first end of said single action bar means elongated member being coupled to the trigger, the second end of said single action bar means elongated member extending to a point adjacent the hammer, said single action bar means elongated member being positioned adjacent the second side of the frame; and

sear means pivotal about an axis parallel to the axis about which the hammer pivots, and sear means being biased toward the hammer, said sear means including a hammer stop abutment;

the hammer further including a second recess for engaging the stop abutment of said sear means;

the second end of said single action bar means elongated member engaging said sear means hammer stop abutment, said single action bar means moving forward in response to the pivoting of the trigger to withdraw said abutment from the second recess in the hammer to release the hammer.

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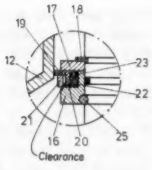
HYDRAULIC SERVO CYLINDER AND PISTON

Hanspeter Kopp, Spraitbach, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Dec. 11, 1978, Ser. No. 968,411
Int. Cl.[3] F15B *15/22*; F16J *1/00, 9/02*
U.S. Cl. 91—400 **6 Claims**



1. In a double-acting hydraulic servo cylinder of the kind having continuously cylindrical high pressure chambers for travel of a piston under pressure force and wherein said chambers extend to an intermediate continuously cylindrical low pressure chamber of said cylinder; including a piston in each chamber disposed for travel therein and connected to a common output with each piston carrying a sealing gasket assembly movable sufficiently past the transition between respective high pressure chambers and the low pressure chamber to effect a pressure relief flow from said high pressure chambers to said low pressure chamber toward the end of a pressure stroke of said piston;

the improvement wherein:

each sealing gasket assembly comprises a seal of flexible and

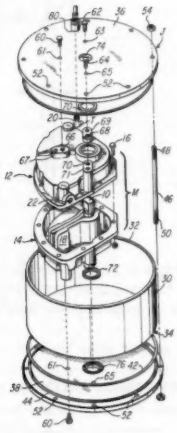
resilient material having a collar mounted in a groove on said piston and having an integral radial flange extending therefrom to resiliently and sealingly engage said cylinder in said high pressure chambers and wherein said flange is of a diameter to preclude sealing in said low pressure chamber when moving thereinto so as to permit relief flow from said high pressure to said low pressure chamber for preventing excess pressure force being exerted on said piston; said sealing gasket assembly including support ring means on said piston encompassing said collar with predetermined radial clearance, extending beyond the piston exterior in supporting engagement with said flange and a wall of said groove, spaced from said cylinder with radial clearance, and radially displaceable to compensate for piston and cylinder misalignment.

4,275,642

AIR ACTUATED FAIL-SAFE ACTUATOR ENCAPSULATED WITHIN ACCUMULATOR TANK

Russell G. Smith, Cincinnati, Ohio, assignor to Xomox Corporation, Cincinnati, Ohio

Filed Sep. 22, 1978, Ser. No. 944,771
Int. Cl.³ F15B *15/17*; F01C *9/00*
U.S. Cl. 91—415 **8 Claims**



1. A fail-safe actuator, comprising:

(a) encapsulatng means for isolating internal actuator components from hostile environments, said encapsulating means defining an air-tight chamber with its internal surfaces;

(b) a vane housing disposed entirely within the air-tight chamber of the encapsulating means;

(c) a shaft which extends from the interior of the vane housing to a location exterior of the encapsulating means and is rotatably journaled in the vane housing, said shaft cooperatively interacting with said encapsulating means so as to prevent portions of the shaft disposed interiorly of the encapsulating means from being exposed to the environment;

(d) a vane located within the vane housing secured to and carried by the shaft for movement therewith, the shaft and the vane being rotatably movable between first and second positions;

(e) first and second ports in the vane housing, the first port communicating with a portion of the vane housing beyond the first position of the vane and the second port being in open communication between the air-tight chamber and a portion of the housing beyond the second position of the vane;

(f) first bidirectional flow means communicating with the first port in the vane housing for supplying and exhausting a pressure media to the interior of the vane housing from and to a location which is external with respect to the encapsulating means; and

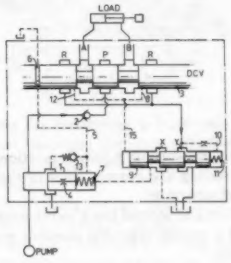
(g) restricted flow means communicating between the external location and the air-tight chamber for permitting fluid flow therebetween at a rate which is substantially less than the rate of fluid flow through the first bidirectional flow means to and from the first port.

4,275,643

HYDRAULIC CONTROL SYSTEMS

James G. Knowles, Lincolnshire, England, assignor to Clayton Dewandre & Co. Ltd., Lincoln, England

Filed Aug. 24, 1979, Ser. No. 69,536
Claims priority, application United Kingdom, Aug. 25, 1978, 34700/78
Int. Cl.³ F15B *13/02*
U.S. Cl. 91—444 **5 Claims**



1. A control system for operating a double-acting hydraulic ram or motor, comprising a proportional meter-out type directional control valve having a spool and a meter-out orifice, a combined flow and pressure control valve having a spring-loaded spool and being in association with the directional control valve, a supply line, a load, a return line from the load, an unloader spool valve, a pilot line and a supply pressure line; the directional control valve constituting means to meter fluid flow from the load; the unloader spool valve being connected by the pilot line to the combined flow and pressure control valve, being connected in the supply line and being responsive to a pressure drop across a restricted orifice, thus providing means to maintain unloader pilot flow substantially constant and independent of supply flow changes; the spring loaded spool providing means to control a restriction in the unloader pilot flow and thus regulate pressure in the supply pressure line; the combined flow and pressure control valve being in the return line and responsive to a pressure drop across the meter-out orifice so that return-line flow is restricted at high pressure drops and supply pressure to the load is increased at low pressure drops, whereby a substantially constant pressure drop is effected across said meter-out orifice independent of load size or direction.

4,275,644

DUAL FLAP CARTON ERECTING MACHINE

Edward L. Moss, Orlando, Fla., assignor to Moss Machinery Manufacturers, Inc., Orlando, Fla.

Filed Apr. 25, 1979, Ser. No. 33,209
Int. Cl.³ B31B *1/62, 1/76*
U.S. Cl. 493—316 **13 Claims**

1. An apparatus for erecting folded cartons having top and bottom flaps, comprising in combination:

a carton track having a first and a second end;

carton magazine means disposed on said first end of said track;

first track movement means for moving a folded carton on

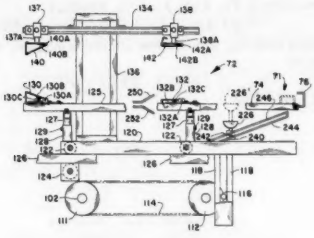
said track from said carton magazine means to a first position;

top flap folding means interposed in said first track for folding the top flaps of the carton;

second track movement means disposed adjacent said first track for moving the carton from said first position to said second end of said track;

carton erecting means disposed at a second position on said second track for erecting the folded carton;

bottom flap folding means disposed at a third position on said second track for folding the bottom flaps of the carton;



sealing means disposed at a fourth position on said second track for sealing the bottom flaps of the erected carton into a rigid structure;

one of said first and second track movement means includes a first and a second rotatable member spaced relative to one another;

flexible means about said rotatable members and having a driving portion on said flexible means for generating a reciprocal movement of said driving portion relative to said track; and

means cooperates with said driving portion for sequentially moving cartons along said track upon rotation of said rotatable members.

4,275,645

CLOSURE FOR SERVICE OPENING

Alonzo W. Ruff, York, Pa., assignor to Expertise Assistance Inc., York, Pa.

Continuation-in-part of Ser. No. 923,316, Jul. 10, 1978, abandoned. This application Nov. 21, 1979, Ser. No. 96,622

Int. Cl.³ F24F *9/00*

U.S. Cl. 98—36 **6 Claims**

1. A power operated closure for a service opening in a wall between a warm area and, for example a frozen product storage area comprising:

at least a pair of flexible curtain members;

an equal number of separate parallel spaced spring-loaded rollers mounted below and substantially vertically aligned with the service opening;

means connecting one end of each curtain to one of said rollers respectively;

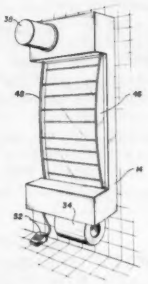
an air plenum chamber surrounding said rollers;

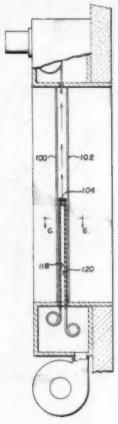
an elongated knife like nozzle joining the opposite end of said curtain members;

power driven means connected to said opposite end and operative when energized to unroll said curtains from said spring-loaded rollers and position them in closing relation to the service opening;

control means operable from the warm side of the opening to release said curtains from said power driven means to permit them to rewind on said rollers to open the service opening; and

means for pressurizing said plenum chamber to circulate warm-side air between said curtains, through said nozzle and over the warm side of the outermost curtain to prevent condensation, maintain spacing therebetween and establish an air curtain across the opening when the curtains are in open position and during opening and closing cycles.





4,275,646

KITCHEN UTENSIL FOR MAKING FLAVORED BEVERAGES

Stephen L. Barna, 1129 N. State Rd., Ionia, Mich. 48846

Filed Sep. 17, 1979, Ser. No. 76,487

Int. Cl.³ A47G *19/16*

U.S. Cl. 99—323 **13 Claims**

1. A pair of hand held tongs comprising:

a U-shaped body having a pair of arms adapted for grasping,

with free ends shaped to clench an object therebetween, and an arcuate, flexible base; said body having a substantially U-shaped cross section which forms an inwardly oriented channel;

a flexible leaf spring having a resilient body with first and second ends; said leaf spring being positioned in said channel at said base, whereby said channel retains said leaf spring in place and conceals the same from view; and

means for connecting said first and second leaf spring ends with a different one of said arm first ends.

4,275,647

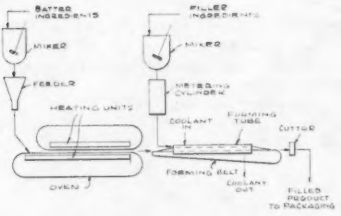
APPARATUS FOR PRODUCING A CENTERFILLED FOOD PRODUCT

Lee Chambers, Groveland, and Melvin E. Ellertson, Northridge, both of Calif., assignors to Carnation Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 787,697, Apr. 14, 1977, abandoned. This application Sep. 14, 1979, Ser. No. 75,614

Int. Cl.³ A47J *37/00*; A21C *3/04*

U.S. Cl. 99—339 **15 Claims**



1. An apparatus for the continuous, straight-through production of a tubular centerfilled food product having an edible baked thermoplastic shell and a core of an edible filling material which comprises

a pair of opposed endless belts having their facing runs vertically spaced apart a distance equal to the desired thickness of the baked shell portion of said product,

means for depositing a layer of a semi-liquid batter onto one of said endless belts,

means for moving the facing runs of said belts in the same direction at the same linear speed whereby said batter layer is carried between the facing runs of the opposed belts to gauge the thickness of said batter layer,

heating means associated with said endless belts adapted to heat the endless belts whereby the batter layer carried between the facing runs of said endless belts is heated and its moisture content is reduced to provide a continuous pliable thermoplastic sheet having a set, controlled thickness,

tube forming means including a cylindrical tube adapted to receive the continuous thermoplastic sheet while in a pliable state and roll the sheet around its longitudinal axis until tne edges of the sheet are butted together to form a continuous, closed cylindrical tube having a longitudinal, non-overlapping seam,

filling means extending into said cylindrical tube to a point beyond which the edges of the sheet are butted together for introducing an edible filling material into the core of said closed cylindrical tube,

cooling means adapted to cool the closed cylindrical tube and

cutting means adjacent the cylindrical tube means for cutting the continuous filled tube into pieces of desired length.

4,275,648

METHOD AND APPARATUS FOR PRODUCING FRUIT JUICES

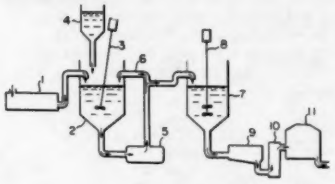
Takenori Mouri, Toyonaka; Kengi Morimoto, Kitamine; Itaru Yoshimoto, Tokyo; Hiroyki Kayama, Kobayashi; Yukio Okazawa, Yokohama, and Touru Sizukuisi, Itami, all of Japan, assignors to Toyo Seikan Kaisha Limited, Tokyo, Japan

Division of Ser. No. 9,736, Feb. 5, 1979. This application Jan. 22, 1980, Ser. No. 114,359

Claims priority, application Japan, Feb. 8, 1978, 53-12324; Feb. 23, 1978, 53-19102

Int. Cl.³ A23L *2/02*

U.S. Cl. 99—483 **1 Claim**



1. An apparatus for producing a fruit juice continuously from a whole fruit including the rind, a fruit rind, a squeeze residue or a frozen product thereof as a raw material, said apparatus comprising

(a) a crusher for crushing the raw material to a size that can be passed through a mesh of 10 mm,

(b) a metering tank for preparing a starting material mixture by mixing the raw material crushed by the crusher with water or both water and a pH-adjusting organic acid,

(c) a heater for heating the starting material mixture to a temperature of 20° to 50° C.,

(d) a comminution tank for treating the heated starting mixture by a homomixer with or without the addition of an enzyme thereby to finely divide the mixture to a size that can be passed through a mesh of 3 mm,

(e) a plurality of enzyme treatment tanks equipped with a stirrer and arranged parallel to each other for performing enzymatic reaction by adding an enzyme to the finely divided starting mixture (when an enzyme is added to the aforesaid comminution tank, the addition of enzyme to said treatment tanks may be omitted) and keeping the temperature of the mixture at 30° to 50° C. with stirring,

(f) a first-stage solid-liquid separator equipped with a filter having a mesh size of 0.1 to 1.0 mm for filtering the reaction mixture that has left the enzyme treatment tanks after the enzymatic reaction thereby to remove large fragments of solids,

(g) a second-stage solid-liquid separator for treating the product from the first-stage solid-liquid separator to further remove suspended materials.

(h) a first-stage cushion tank provided between the first-stage solid-liquid separator and the second-stage solid-liquid separator for temporarily storing the liquid from the first-stage solid-liquid separator thereby to prevent no-load operation of the second-stage solid-liquid separator,

(i) a heater-cooler for heating the liquid from the second-stage solid-liquid separator at 60° to 100° C. for 20 to 40 seconds and then cooling it to a temperature of 10° to 50° C.,

(j) a second-stage cushion tank provided between the second-stage solid-liquid separator and the heater-cooler for temporarily storing the liquid from the second-stage solid-liquid separator to prevent no-load operation of the heater-cooler,

(k) a third-stage solid-liquid separator equipped with a filter having a mesh size of 0.1 to 1.0 mm for filtering the liquid from the heater-cooler to remove foreign matter,

(l) a concentrator for concentrating the liquid from the third-stage solid-liquid separator by evaporation, and

(m) a third-stage cushion tank provided between the heater-cooler and the third-stage solid-liquid separator for temporarily storing the liquid from the heater-cooler to prevent no-load operation of the concentrator; provided that the second-stage solid-liquid separator (g), the first-stage cushion tank (h), and the third-stage solid-liquid separator (k) may be omitted.

4,275,649

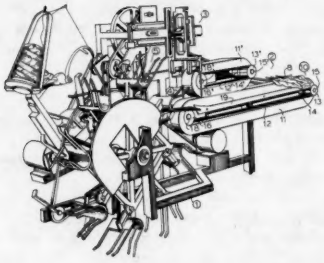
MECHANICAL BUNCHER FOR LEAFY VEGETABLES

Donald L. Peterson, Martinsburg, W. Va.; Ajit K. Srivastava, East Lansing, and Galen K. Brown, Okemos, both of Mich., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 26, 1979, Ser. No. 88,673

Int. Cl.³ B65B *13/02*

U.S. Cl. 100—4 **10 Claims**



1. An apparatus for use in combination with a mechanical harvester for bunching leafy green vegetables comprising:

a. means for conveying said leafy greem vegetables to a packing station;

b. cycling packing means for separating incremental portions of said vegetables from said conveying means and for feeding said portions into one of a plurality of accumulator pockets which are mounted on a rotatable wheel, wherein said one pocket is in a position to receive said vegetables at said packing station;

c. means for sensing a predetermined quantity of vegetables in said one pocket;

d. means responsive to said sensing means for rotating said rotatable wheel to position another of said plurality of accumulator pockets to receive said vegetables at said packing station; and

e. means for binding together said predetermined quantity of vegetables.

4,275,650

COMPACTING APPARATUS

Edward F. Telling, Worthing, England, assignor to Trewhella Brothers (UK) Ltd., Great Britain

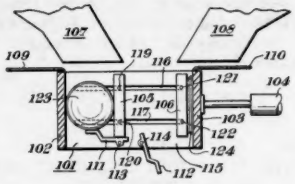
Division of Ser. No. 927,531, Jul. 24, 1978, Pat. No. 4,213,384. This application Jan. 7, 1980, Ser. No. 109,991

Claims priority, application United Kingdom, Jul. 26, 1977, 31402/77; Oct. 14, 1977, 42925/77; Feb. 3, 1978, 04530/78; Feb. 14, 1978, 05764/78; Apr. 6, 1978, 13597/78; Apr. 18, 1978, 15102/78

Int. Cl.³ B30B *15/30*

U.S. Cl. 100—45 **13 Claims**

1. A double-acting compacting apparatus comprising a first compacting plate; a second compacting plate attached to and spaced from said first compacting plate; a third, stationary compacting plate arranged between said first and said second compacting plates; means for mounting said first compacting plate and said second compacting plate for movement relative to said third compacting plate; drive means for providing movement of said first and said second plates relative to said third plate; means for providing a free-fall aperture such that compacted matter can automatically fall freely from the apparatus upon completion of a compaction stroke; feed means for feeding matter to be compacted alternately to respective



spaces formed between respective ones of said first and said second compacting plate and said third compacting plate during said movement; and means for covering each of said spaces while compaction is occurring therein and for uncovering each of said spaces for receiving said matter while compaction is occurring in the other space.

4,275,651

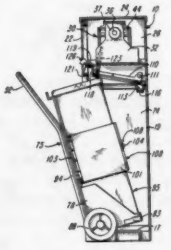
COMPACTOR REFUSE AND OTHER MATERIALS

Hugh F. Groth; Guilbert M. Hunt, both of Brecksville, and Ronald E. Shaner, Rossburg, all of Ohio, assignors to Lambert Corporation, Dayton, Ohio

Filed May 15, 1980, Ser. No. 151,196

Int. Cl.³ B30B *15/00*

U.S. Cl. 100—229 A **18 Claims**



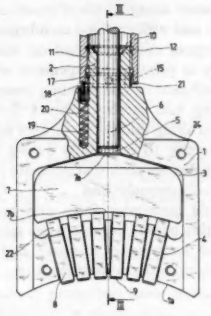
1. In a vertical compactor adapted for compressing batches of refuse or other waste material and including a frame, a generally horizontal ram member, actuator means mounted on said frame and supporting said ram member for generally vertical movement, an open top container positioned at a compacting station within said frame below said ram member and adapted to receive the material, power operated means for moving said actuator means to move said ram member between a retracted upper position and an extended lower position within said container for compressing the material within said container, and a wheel supported cart including a base member supporting the bottom wall of said container and providing for moving said container into and out of said compacting station, the improvement wherein said container comprises an open top container of molded plastics material and having an intermediate wall portion between said open top and said bottom wall, said cart including restraining means above said base member and extending in a confining position around said intermediate wall portion of said container for maintaining substantially the shape of said molded plastic container during compacting, and said restraining means being movable between said confining position and a released position to provide for conveniently removing said container laterally from said cart.

4,275,652

MARKING HEAD FOR COLD STAMPING SYMBOLS ON A METALLIC SURFACE

Ermanno Bo, Ternay, France, assignor to Societe Anonyme Dite BBM, Feyzin, France

Continuation of Ser. No. 902,096, May 1, 1978, abandoned. This application Dec. 31, 1979, Ser. No. 112,408
Claims priority, application France, May 3, 1977, 77 14018
Int. Cl.³ B44B *5/00*
U.S. Cl. 101—4 **10 Claims**



1. In combination with a cartridge operated striking tool having a barrel and a piston guided in said barrel, a marking head comprising a housing having opposite ends and being formed with a cavity and a plurality of channels extending from said cavity to one of said opposite ends of said housing, said housing including a central shank projecting from the other end thereof and being provided with a central bore therethrough communicating with said cavity, the piston of said striking tool extending with a an end portion thereof through said bore; a plurality of stamps respectively located in said channels to be guided therein movable in longitudinal direction and projecting with ends thereof beyond said one end of said housing; means at the other end of said housing for connecting said other end of said barrel of said tool turnably about the axis of said barrel, said connecting means comprising an outer screw thread on said shank and screwed into a corresponding inner screw thread in said barrel; a force transmitting member located in said cavity between said piston and said stamps for transmitting a blow imparted by explosion of a cartridge to the piston onto the plurality of stamps; means for releasably holding said housing in a selected one of a plurality of fixed positions turned about the axis of said barrel; and means for braking said piston and comprising a pair of opposite transverse bores in said shank intersecting said axial bore, a pair of balls respectively located in said transverse bores, and spring clips pressing said balls against the periphperal surface of said piston.

4,275,653

LINE PRINTER SYSTEM AND METHOD OF OPERATION WITH MICROPROCESSOR CONTROL

Richard D. Bolcavage, Kirkwood, N.Y.; Arthur E. Fleek, Cary, N.C., and Mitchell P. Marcus, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 28, 1980, Ser. No. 115,855
Int. Cl.³ B41J *1/20*
U.S. Cl. 101—93.14 **20 Claims**

1. A printer system comprising in combination

a printer mechanism including

a continuous moving type element having plural uniformly spaced characters arranged in a row,

said characters occurring at various locations and frequencies on said type element,

a plurality of uniformly spaced print units arranged in a row parallel with said row of characters and co-acting therewith to define a print line,

said print units and said characters having different pitches whereby the relative motion between type element and said print units causes sequential scan and subscan alignments of said characters and said print units;

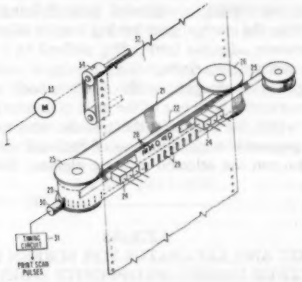
indexing means for advancing a print medium in controllable increments relative to said print line; and

control means for selectively operating said print units for printing selected characters during motion of said type element at selected print positions of a print line including

means for supplying print data signals representative of the selected characters and print positions for a line of data to be printed at an indexable position of said print medium,

means for supplying a start scan data signal specifying the start print scan occurring at completion of print medium advance to a selected line index position,

storage means containing character occurrence data representative of the number of occurrences and specifying the type element positions of said characters on said type element,



said type element positions of said characters being in terms of the number of print scans said characters are displaced relative to a reference position on said type element,

processor means operable during print medium advance to a selected line index position for

1. examining said print data signals for each print position of said line of data for each selected character to be printed thereat,

2. determining from said character occurrence data in said storage means and said start scan data signal the earliest type element position after start scan for each selected character in said line of data, and then,

3. determining the earliest print scan following start scan during

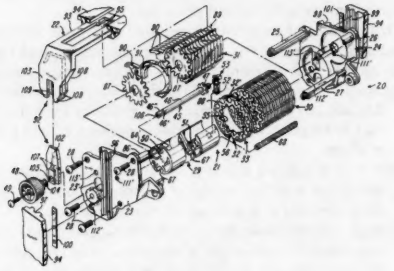
which the earliest type element position for each selected character and the desired print position will align,

means controllable by said processor means for selectively operating said print units in accordance with the order of the print scans as determined by said processor means commencing with said start print scan and including scan storage mean containing in a scan order arrangement said print scan data determined for said selected characters by said processor means.

4,275,654
SELECTIVE PRINTING APPARATUS

Paul H. Hamisch, Jr., Franklin, and Robert M. Pabodie, Dayton, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Nov. 19, 1979, Ser. No. 95,848
Int. Cl.³ B41K *1/12*; B41J *1/32*
U.S. Cl. 101—110 **23 Claims**

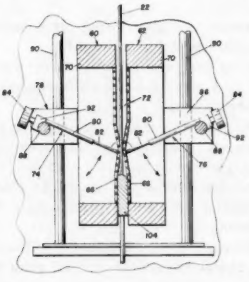


1. For a printer: a platen, a series of wheels, a plurality of different printing elements for each wheel, the wheels being settable to bring one of the printing elements to a printing position adjacent the platen, each wheel being elastically deformable and having an internal gear defining a generally central hole, the internal gear having a series of gear teeth, the space between adjacent teeth being defined by a pair of converging surfaces, a selector shaft having a gear selectively engageable with the gear teeth of any wheel, and a helical spring cooperable with one of the pairs of converging surfaces of each wheel for detenting the wheels, wherein the helical spring cooperates with the pairs of inclined surfaces of the wheels to cam the selected printing element to the printing position.

4,275,655
METHOD AND APPARATUS FOR SCREEN PRINTING REGISTERED IMAGES ON OPPOSITE SIDES OF A WEB

Gerard P. Artaud; Clarence O. Schrader, both of Santa Ana, Calif., and George W. Reinke, Reno, Nev., assignors to The Arnold Engineering Company, Marengo, Ill.

Filed Jan. 23, 1979, Ser. No. 5,881
Int. Cl.³ B41F *15/36, 15/08*
U.S. Cl. 101—123 **24 Claims**



1. Apparatus for screen printing mirror inversion images in registration on opposite sides of a web of material, said apparatus including;

a matched pair of ink-receiving screen stencils each presenting a flat printing membrane having an open image area permitting ink transfer therethrough, said image areas being mirror inversions of one another;

said pair of stencils being provided with register means for holding said images in mutual registration;

a stationary framework fixedly supporting said stencils with said membranes juxtapositioned in parallel, laterally spaced relation to define a printing zone therebetween;

means for supplying ink to said stencils;

a web support adapted to position said web such that it extends through said printing zone in parallel relation to said flat membranes generally equidistant therefrom; a squeegee assembly including a unitary one-piece carriage mounted on said framework adjacent said stencils for shifting movement along a path of travel extending generally parallel to said web and said membranes, and a pair of opposed squeegees each mounted on said carriage and each normally in printing engagement with one of said membranes outboard of said printing zone;

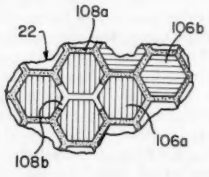
means for shifting said carriage from a first position to a second position along said path of travel while said web is stationary whereby to conjointly sweep said squeegees across said membranes such that opposite sides of the web are printed synchronously; and

means to lift said squeegees from said membranes, said means for shifting being operable when said squeegees are lifted from said membranes to move said carriage from said second position to said first position.

4,275,656
BUBBLE PRINTING METHOD

John R. Choma, Cambridge, Mass., assignor to Charles J. Choma and Lena G. Choma, both of Plainville, Mass.

Filed Feb. 14, 1979, Ser. No. 11,784
Int. Cl.³ B41M *1/20, 1/42*; B05D *1/34, 5/06*
U.S. Cl. 101—211 **11 Claims**



1. A method of printing on a surface, said method comprising the steps of:

forming a plurality of first bubbles in selected sizes, selected ones of said bubbles comprising a fluid film containing a specified first colorant; said selected sizes being chosen such that said first bubbles are formed in abutting relationship with one another thereby forming first interstices of capillary dimensions between one another;

applying said first bubbles to said surface in a substantially ordered first array;

selectively depositing said first colorant on said surface from said selected bubbles in a pattern according to the distribution of said selected bubbles in said first array; and

applying discrete portions of a second set of specific colorants in a substantially ordered second array above selected ones of said first interstices, thereby printing on said surface by capillary action a pattern of said second set of specific colorants arranged in accordance with the distribution of said selected first interstices.

4,275,657

SPIRALLY WOUND PYROTECHNIC CHARGE USEFUL FOR THE PROPULSION OF AN ENGINE AND THE LIKE

Francis A. Dallet, Tresses, France, assignor to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Dec. 12, 1977, Ser. No. 859,825

Claims priority, application France, Dec. 30, 1976, 76 39522; Apr. 20, 1977, 77 11939

Int. Cl.[2] F42B 1/00

U.S. Cl. 102—531 22 Claims

1. A pyrotechnic charge located in a chamber for use in the propulsion of an engine, comprising at least one band of flexible material wound in several spiral turns about a central axis, elongate strands of propellant fixed to said flexible band, said strands having a length and said band having a width less than said length of the strands of propellant, each said strand of propellant extending in a plane containing said central axis, and being positioned radially of said axis directly between two adjacent said turns of said flexible material, wherein each of the strands of propellant is fixed to said flexible band by adhesive and said strands of propellant have at least one concave surface, said flexible band in intermediate between the two ends of the propellant, said band being provided with supporting means, said band being the sole support for the strands in said chamber.

4,275,658

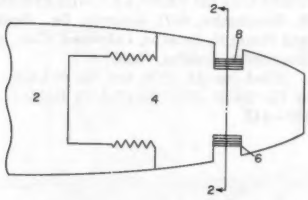
SAFING AND ARMING SIGNATURE FOR FUZES

Richard N. Gottron, Rockville, and Lyndon S. Cox, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 12, 1979, Ser. No. 84,047

Int. Cl.[3] F42C 11/02

U.S. Cl. 102—210 10 Claims



1. Means for enabling an object to generate signals when said object is subjected to gaseous fluid flow, said means comprising at least one recess on the exterior of said object, and piezoelectric tape means in said recess for generating said signals in response to pressure variations in said recess.

4,275,659

APPARATUS FOR OPERATING TRANSPORT VEHICLES MOVABLE ON A TRACK CARRIED BY A TRAIN OF RAILROAD CARS

Josef Theurer, Vienna, and Manfred Brunninger, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

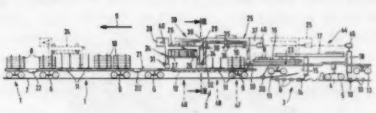
Filed May 8, 1979, Ser. No. 37,099

Claims priority, application Austria, Sep. 14, 1978, 6667/78

Int. Cl.[3] E01B 27/11, 29/05

U.S. Cl. 104—2 6 Claims

1. A track renewal train comprising a succession of storage cars and a work car, a through track carried by the cars, a fit transport vehicle movable on the through track towards and away from the work car for moving new ties towards the work car and old ties away from the work car, a drive for moving the first transport vehicle, a second transport vehicle adjacent the first vehicle and movable on the through track between the first vehicle and the work car for transferring the new ties from the first vehicle and the old ties to the first vehicle and for transporting the ties between the work car and the first vehicle, respective abutment elements on the vehicles arranged to contact each other when the vehicles move into abutting relationship, a control circuit connecting the drive to the abutment elements and being closed by their contact with each other for operation of the drive, and a signalling arrangement including emitter and receiver means of perceptible stop- and go-signals positioned to emit and receive the signals within the range of perception of at least one of the transport vehicles for controlling the operation thereof.



4,275,660

AUTOMATICALLY CROSS-GUIDED VEHICLE, ESPECIALLY FOR THE PUBLIC LOCAL PASSENGER TRAFFIC

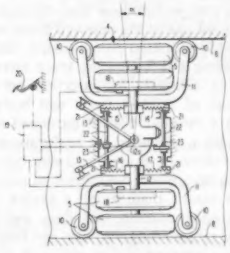
Hans-Joachim Förster, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 25, 1978, Ser. No. 945,335

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1977, 2743077

Int. Cl.[3] B61F 9/00

U.S. Cl. 104—247 14 Claims



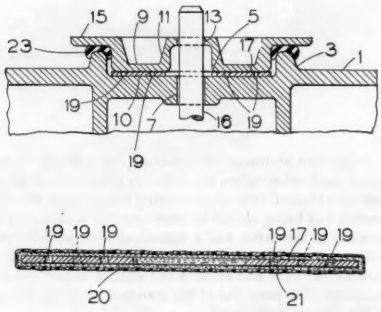
1. A steerable vehicle adapted for track tied and non-track-tied operation, the vehicle comprising a steerable axle means having deflectable wheels and at least one axle means having non-steerable wheels relative to the axle means, said last-mentioned axle means being pivotally secured at the vehicle, and cross-guide roller means mounted on the vehicle on both sides thereof within an area of the vehicle axle means and carried at least indirectly by the respective axle bodies of the axle means, characterized in that the pivotal axle means is elastically centered in a straight driving position, the pivotal axle means being pivotal out of straight driving position by steering forces produced by the cross-guide roller means against the force of centering spring means, the centering spring means and the prestress thereof being selected so as to be so strong that brake force differences of one vehicle side with respect to the other do not produce an automatic axle pivoting, and in that means are provided for more strongly prestressing the centering spring means during braking than normally.

4,275,661

RAILWAY CAR LUBRICATED CENTER BEARING

Kenneth L. Mowles, Roanoke, Va., assignor to Hennessy Products, Inc., Chambersburg, Pa.

Filed Jul. 11, 1979, Ser. No. 56,781
Int. Cl.³ B61F *5/16, 5/50;* **F16C** *17/04, 33/74*
U.S. Cl. 105—199 C **13 Claims**



1. In combination with a railway car center plate assembly comprising a truck-mounted part forming an upwardly open cylindrical recess having a flat upwardly-facing bottom surface and a body-mounted part having a depending cylindrical boss rotatably receivable in the truck recess and having a flat downwardly-facing bottom surface, a hard metal disc disposed between the opposed horizontal surfaces of said boss and said recess, said disc having smooth top and bottom surfaces and being formed with a plurality of perforations, said disc being of sufficient hardness to retain its original configuration under load during operation of the railway car, and a quantity of lubricant material substantially surrounding said disc and filling said perforations, whereby upon relative rotation between said truck- and body-mounted parts, lubricant material on said plate and within the perforations therethrough is uniformly distributed to at least one of the opposed horizontal surfaces of said truck- and body-mounted parts, thereby reducing friction and consequent wear and facilitating truck swivel.

9. A lubricating assembly for insertion between opposed horizontal surfaces of railway truck and body center plate parts comprising a circular disc of hardened steel, said disc being formed with a plurality of perforations substantially uniformly spaced through its area, said disc being of sufficient hardness to retain its original configuration under load during operation of the center plate parts, a sealed disintegratable plastic envelope encapsulating said disc, and a quantity of lubricant material surrounding said disc and filling the perforations therein also contained in said envelope to lubricate said center plate parts after the plastic envelope disintegrates.

4,275,662

RAILWAY HOPPER CAR ROOF SUPPORT STRUCTURE

Franklin P. Adler, Michigan City, Ind., and Marvin Starks, Houston, Tex., assignors to Richmond Tank Car Company, Houston, Tex.

Filed Jul. 10, 1979, Ser. No. 56,213
Int. Cl.³ B61D *17/16, 39/00, 49/00*
U.S. Cl. 105—377 **6 Claims**

1. A covered hopper car having spaced side wall units having wall posts, end hoppers and intermediate hopper means, a roof structure comprising:

curved roof sheet means extending on the top of the hopper car and having side margins;

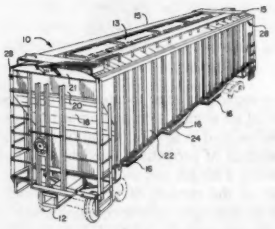
hatch opening means with cover means and said opening means being adapted to receive lading for entry into said end hoppers and into said intermediate hopper means;

side beam means extending the length of the vehicle and being mounted to the side wall unit and providing a connection with the roof sheet means;

said side beam means comprising first and second angle members forming a longitudinally extending beam member;

said first angle member having a lip extending inwardly and upwardly from the side wall unit to said roof sheet means;

partition means with an arcuate top conforming to the contour of the curved roof sheet means and being connected with the side wall units and roof sheet means to provide a



rigid structural interconnection between the attached car members;

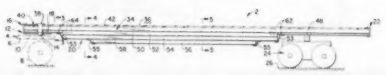
connection means mounted on the arcuate top of said partition means and providing a structural transition member for improved force distribution between the partition means and the roof sheet means;

weld means connecting the stiffener means with said side plate means and thereby forming reinforcing structure surrounding the side margins of the curved roof sheet means.

4,275,663

CORRUGATED VEHICLE UNDERFRAME

Eugene W. Sivachenko, 6471 Riverside Dr., Redding, Calif. 96001, and Firoze H. Broacha, Lakewood, Colo., assignors to E. W. Sivachenko, Redding, Calif.

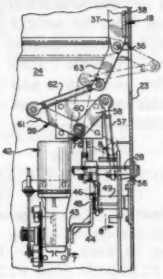
Filed Jun. 14, 1978, Ser. No. 915,435
Int. Cl.³ B61D *17/00;* **B61F** *1/00;* **B62D** *21/00*
U.S. Cl. 105—413 **10 Claims**

1. A vehicle for carrying a load on a substantially flat and generally horizontal loading surface having a given width and length, the vehicle comprising: an underframe extending over substantially the full width and length of the surface and having a substantially uniform cross-section over substantially its full width, the underframe comprising a corrugated plate including a plurality of longitudinally extending, side-by-side corrugations having an overall width substantially equal to the overall width of the surface; means proximate longitudinal ends of the underframe for movably supporting the underframe on a carrying surface for the vehicle; attaching means carried by the underframe for operatively interconnecting the underframe with the movably supporting means; means carried by the underframe for defining the loading surface, the corrugated plate defining substantially the only structural vertical and longitudinal load transmitting and supporting element between the movably supporting means.

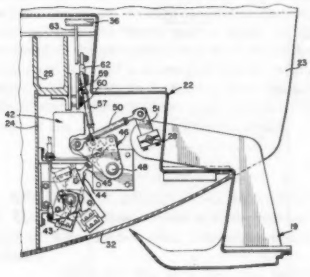
4,275,664

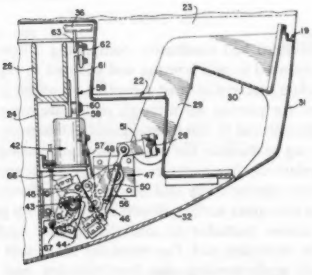
STEP-PLATFORM OPERATION

Redreddy S. Reddy, Skokie, Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed Sep. 26, 1979, Ser. No. 79,031
Int. Cl.³ B61D 23/02
U.S. Cl. 105—430 8 Claims







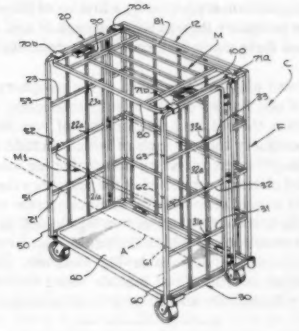
1. In a transit vehicle having an opening for high and low level loading and unloading of passengers, a step and platform assembly at the bottom of the opening having a step rotatable along one axis between an open or down position and a closed or raised position and a platform rotatable along an axis mutually perpendicular to said one axis and between an open or raised position and a closed or down position, whereby said step is usable for low level loading and unloading of passengers when the step is in the open or down position and the platform is in open or raised position while said platform is usable for high level loading and unloading of passengers when the platform is in the closed or down position and the step is in closed or raised position, the improvement in a step-platform operator for simultaneously moving said step between closed and open positions and said platform between closed and open positions, said operator including a reversible drive motor having a rotatable output shaft, and drive means interconnecting the drive motor and the step and interconnecting the drive motor and the platform to utilize the weights of the step and platform to counterbalance each other during movement thereof between said positions, said drive means having a lever and connecting rod assembly which transmits the rotatable force of the output shaft to the step and platform, and said lever and connecting rod assembly including a main idler lever assembly having a step idler lever and a platform idler lever rotatably mounted on an idler shaft, a drive motor output lever on the output shaft connected to the step idler lever and the platform idler lever, a step lever connected to the step and in turn connected to the step idler lever, said idler shaft being parallel to said drive motor output shaft, a crank lever having a pair of arms and being rotatably mounted on a shaft mutually perpendicular to the idler shaft, one of said arms being connected to the platform idler lever, and a platform lever connected to the platform and said other of said arms.

4,275,665

VARIABLE CONFIGURATION CONTAINER WITH MODULAR, EASILY REMOVABLE WALL OR SHELF STRUCTURE

Richard V. Silverman, Los Angeles, Calif., assignor to Bonus-Bilt, Inc., Glendale, Calif.

Filed Apr. 2, 1979, Ser. No. 26,018
Int. Cl.³ A47B 85/00
U.S. Cl. 108—14 9 Claims



1. A container having a variable configuration, comprising:
a vertical rear wall;
vertical side walls disposed parallel to each other and perpendicular to said rear wall;
said side walls having vertically extending, parallel front edges, and having a plurality of vertically spaced pairs of transverse openings near said front edges, each pair of openings defining a single horizontal axis;
said side walls also having a plurality of pairs of horizontally extending stringers on the inner surface thereof, each of said stringers also having at least one transverse opening therein, said openings being in matched pairs each of which defines a horizontal axis extending through said container; and
a modular shelf or wall structure having a rectangular frame with two ends, a separate latch extending longitudinally from each of said ends, said latches having a single axis, handle means for retracting said latches, and tab means projecting from each of said ends for engaging either said front edges of said side walls or the upper surfaces of a pair of said stringers;
whereby said modular structure may either be placed between said front edges to form a wall section, or upon a pair of said stringers to form a shelf, and is then secured in place by said tab means as well as by the engagement of said latches with the corresponding pair of openings.

4,275,666

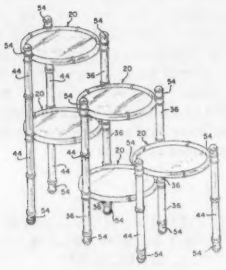
MODULAR TABORET KIT

Theodore W. Schriever, Syracuse, N.Y., assignor to Dart Industries Inc., Los Angeles, Calif.

Continuation of Ser. No. 821,846, Aug. 4, 1977, abandoned. This application Aug. 30, 1978, Ser. No. 938,287

Int. Cl.³ A47B *57/00*

U.S. Cl. 108—101 **8 Claims**



1. A taboret comprising:

first, second and third horizontal platforms vertically displaced from each other and horizontally offset from each other;

said first platform supported by a first set of three legs joined to the periphery thereof wherein each of said legs include at least three equilength connecting detachable leg members;

said second platform supported at the periphery thereof by one of said first set of legs by interconnection with the leg members thereof, and a second set of two legs joined to the periphery thereof each of which include at least two equilength interconnecting detachable leg members; and

said third platform supported at the periphery thereof by one of said second set of legs by interconnection with said leg members, and a third set of two legs joined to the periphery thereof each of which include at least two equilength interconnecting detachable leg members wherein said platforms are round and include raised annular rim portions substantially semicircular in cross-section.

4,275,667

SHEET COUNTING APPARATUS

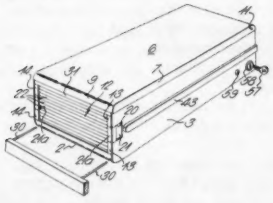
Graham H. Hilton, Lovedean, England, assignor to De La Rue Systems Limited, London, England

Filed Dec. 5, 1979, Ser. No. 100,479

Claims priority, application United Kingdom, Dec. 8, 1978, 47673/78

Int. Cl.³ E05G *3/00*

U.S. Cl. 109—44 **16 Claims**



1. A security cassette comprising:

(a) a casing constructed so as to encompass a stack of sheets;

(b) support means to support the stack of sheets within said casing;

(c) a wall at one end of the casing with a sheet access aperture within said wall of said casing to permit transmission of said sheets into and out of the cassette;

(d) movable shutter means arranged when in a first position to obstruct said aperture and when in a second position to permit transmission of said sheets;

(e) mechanism to move said shutter means from said first position to said second position when actuated by external actuation means, said mechanism being arranged to return the shutter means from the second position to the first position when said external actuating means is removed;

(f) latching means to prevent further movement of said shutter means after its return to said first position; and

(g) manually operable means to release said latching means.

4,275,668

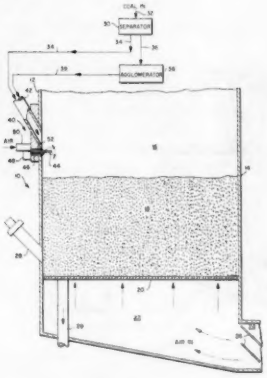
COAL FEED SYSTEM FOR A FLUIDIZED BED COMBUSTOR

Ernest L. Daman, Westfield, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Aug. 28, 1980, Ser. No. 182,207

Int. Cl.³ F23G *5/00, 7/00;* F22B *1/00*

U.S. Cl. 110—245 **7 Claims**



1. A fluidized bed combustor comprising a housing, grate means supported in said housing and adapted to support a bed of particulate material at least a portion of which is combustible, means for passing air through said grate means and said particulate material to fluidize said particulate material, means for receiving particulate fuel material and separating said material into relatively fine particles and relatively coarse particles, a distributor supported by said housing at an elevated position relative to the upper surface of said bed, means for passing said relative coarse particles to said distributor, agglomeration means for receiving said fine particles from said separating means and agglomerating said fine particles, and means for passing said agglomerated particles to said distributor, said distributor including means for distributing said particles onto selected areas extending across the upper surface of said bed.

4,275,669

CANE DIPPER-PLANTER WITH LIQUID TREATING

Kenneth R. Atkinson, Mail Service 368, Gin Gin, Queensland, Australia (4671)

Filed Apr. 27, 1979, Ser. No. 34,078

Int. Cl.³ A01C *5/06, 1/06*

U.S. Cl. 111—3 **5 Claims**

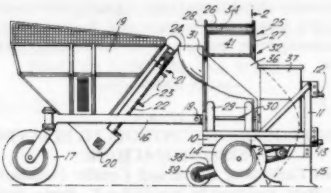
1. A cane dipper-planter of the type having a tractor-drawn main frame, a drill plough on the main frame for opening a furrow, a container for treating liquid, feed means for feeding cane setts to the treating liquid, and delivery means for deliver-

ing said treated cane setts, wherein the improvements comprise:

a drum having opposed spaced end walls and a peripheral side wall extending between said end walls, said drum being mounted on the main frame for rotation about a substantially horizontal axis substantially parallel to the direction of travel of said dipper-planter, the lower part of said drum forming the container for the treating liquid,

means for mounting said main frame on ground wheels,

means for rotating the drum, and supporting wheels for supporting said drum during rotation,



an inlet opening in an end wall of the drum for feeding cane setts to said drum, and wherein

said delivery means includes a delivery chute leading from within the drum through an outlet opening in the other end wall of the drum, and a series of lifting members secured to the peripheral side wall of the drum, said lifting members being of a shape and size to receive and lift cane setts, when the drum is rotated, from the lower part of the drum and discharge them gravitationally from the upper part of the drum to said delivery chute.

4,275,670

SEED DRILL MOUNTING ARRANGEMENT

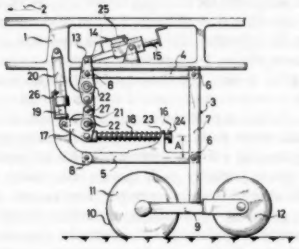
Heinz Dreyer, Hasbergen-Gaste, Fed. Rep. of Germany, assignor to Amazonen-Werke, Hasbergen-Gaste, Fed. Rep. of Germany

Filed Jul. 10, 1979, Ser. No. 56,365

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1978, 2830195

Int. Cl.³ A01C 5/06

U.S. Cl. 111—85 **15 Claims**



1. A seed drill comprising a frame and furrow openers each having a press wheel joined thereto, the furrow openers and the adjoined press wheels being disposed in two transverse rows, one row behind the other row, and the furrow openers and the adjoined press wheels of one row being offset from the furrow openers and adjoined press wheels of the other row, as seen in the direction of travel, the furrow openers comprising at least one disk set at an angle to the direction of travel, each furrow opener and its press wheel being mounted on the frame for movement in an upright plane by a mounting means comprising two cross members situated one over the other and extending at least approximately parallel to one another, and which are each joined by pivots at one end to the frame and at the other end to the furrow opener and its press wheel, a resilient element interposed between the frame and one of the mounting means biasing the furrow openers toward the ground, the resilient element being disposed at least approximately parallel to the cross members when the furrow openers are in the working position, and adjusting means for adjusting the level of one of the furrow openers in relation to its press wheel by movement of some of the pivot joints between the cross members and the furrow openers, and ganging means interconnecting said one of the furrow openers and at least another of the furrow openers so that the adjusting of said one furrow opener is effective to to adjust a gang of the furrow openers.

4,275,671

SEED SOWING IMPLEMENTS

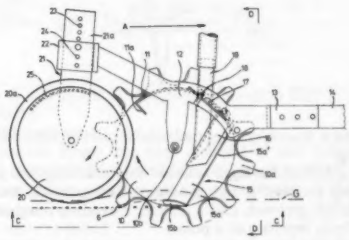
Christopher J. Baker, Bunnythorpe, R.D., Feilding, New Zealand

Continuation of Ser. No. 927,997, Jul. 26, 1978, abandoned. This application Apr. 14, 1980, Ser. No. 140,016

Claims priority, application New Zealand, Jul. 26, 1977, 184742

Int. Cl.³ A01C 5/00

U.S. Cl. 111—85 **9 Claims**



1. A seed sowing implement comprising a circular cutting blade mounted for rotation about a horizontal axis in a substantially vertically plane extending in the direction of intended travel of the blade and having a vertically disposed and substantially flat peripheral cutting edge part arranged in use to penetrate and form a vertical slit in the ground as the implement is moved forwardly along, a coulter support mounted in juxtaposition with an upper part of said blade and a pair of coulter members mounted on said support, one on each side of said blade, said coulter members being each formed from strip metal into a substantially L shape when viewed from the front or rear with a long leg extending upwardly adjacent the blade for detachable connection to its respective support and with a short leg extending laterally away from the blade to define a coulter tip part, the long leg of each coulter member being mounted in splayed relationship relative to the respective side face of the blade with at least the lower leading edge portion of each long leg connecting with the foremost portion of the tip part being arranged for sliding contact with said respective side face and said connections between the coulter members and the coulter support comprising fastening means, said fastening means permitting a limited amount of lateral movement of the coulter members relative to the cutting blade whereby forces exerted by the ground on the splayed long legs of the coulter members as the implement is moved along will constantly maintain said lower leading edge portions of such members in sliding contact with the respective blade side faces, said coulter tip parts each having a sharp leading edge and broad trailing formation projecting laterally of the line of cut of the blade and being disposed for location and operation solely below ground level at a point substantially directly below the axis of rotation of the cutting blade and above the lowest point of the cutting edge thereof so that both tip parts form a com-

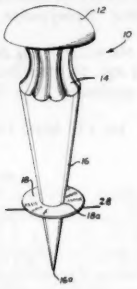
mon passage extending from both sides of the ground slit and below the ground level as the implement is moved forwardly, means for determining the depth of cut of the blade and location of the coulter tip parts below ground level, and a seed duct member provided in juxtaposition with the coulter support and arranged to feed seeds from a supply source into the passage at a point close to the coulter tip parts behind the leading edge portions thereof.

4,275,672

DIBBER

L. Susan Clad, 419 Starmount La., Bakersfield, Calif. 93309

Filed Jun. 13, 1979, Ser. No. 48,094
Int. Cl.³ A01C *5/00*
U.S. Cl. 111—99 **1 Claim**



1. In a manually depth adjustable dibber implement, comprising:

(a) a dibber, having a rounded top extending into a narrowing grooved gripping section, said gripping section also being grooved, and a section, extending integrally therefrom, tapering to a point;

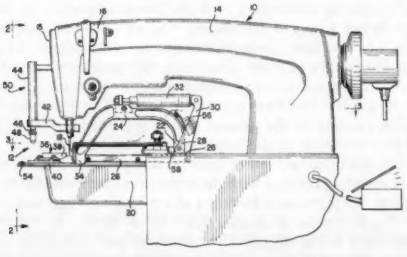
(b) a plurality of disks, respectively, having centered apertures of varied diameters, slidably detachable at varied height levels on the dibber, the disks having, respectively, a collar, surrounding and extending from the respective apertures of the disks, stabilizing their positions when slidably attached on the dibber.

4,275,673

APPARATUS EMPLOYED IN THE ATTACHMENT OF HOOK AND EYE TAPE PORTIONS TO A BRASSIERE

Ronald J. Boser, Dix Hills; Henry J. Watts, E. Northport, both of N.Y., and Walter P. Siegel, deceased, late of Lebanon, N.J. (by Dorothy Siegel, executrix), assignors to Union Special Corporation, Chicago, Ill.

Filed Sep. 10, 1979, Ser. No. 73,970
Int. Cl.³ D05B *3/18*
U.S. Cl. 112—105 **9 Claims**



1. An apparatus used in combination with a computer controlled sewing machine for aligning and securing independent fabric elements prior to and during a sewing cycle comprising:

a fabric positioning holder mean having its movement controlled by said computer means, including jaw means for securing fabric means;

horizontally movable positioning lever means having fabric centering means;

means operative for driving said horizontally movable positioning lever means between a series of predetermined positions along with said jaw means;

a stationary fabric aligning means located in a predetermined position with respect to said jaw means; and

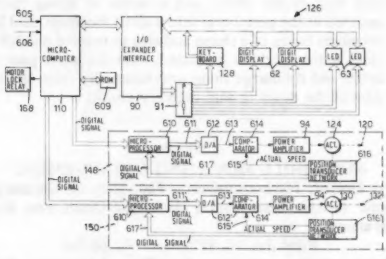
a preliminary clamp means securing said fabric means within said jaw means and between said horizontally movable positioning lever means prior to the initiation of the work cycle.

4,275,674

MICROPROCESSOR CONTROLLED ELECTRONIC SEWING MACHINE

Gianfranco Carbonato, Turin, and Camillo Bussolati, Milan, both of Italy, assignors to Necchi S.p.A., Pavia, Italy

Filed May 22, 1979, Ser. No. 41,293
Claims priority, application Italy, Feb. 21, 1979, 42904 A/79
Int. Cl.³ D05B *3/02*
U.S. Cl. 112—158 E **34 Claims**



1. In an electronic type sewing machine having a bed, a standard rising from said bed, a horizontal arm overhanging said bed, said arm ending with a head, a needle bar means disposed in said head for enabling transverse oscillation thereof relative to the direction of fabric feed in said sewing machine, feed means for adjusting the length and direction of said fabric feed, actuator means for adjusting the transverse position of said needle bar means and the positional displacement of said feed means in response to control signals provided thereto for providing stitches at predetermined stitch position coordinates in a selected stitch pattern and first static memory means for retrievably storing a first plurality of different predetermined selectable stitch patterns each having associated retrievably stored bight and feed data corresponding to sets of predetermined desired stitch positional coordinates of said needle bar and feed means for defining said associated desired stitch position coordinates for the stitches comprising said selectable stitch patterns; the improvement comprising microcomputer integrated circuit means operatively connected to said static memory means and to said actuator means, and means operatively connected between said actuator means and said microcomputer means for providing a digital input signal to said microcomputer means representative of the actual position of said actuator means, said microcomputer means, said actuator means and said actual position signal providing means comprising means for selectively processing said stored stitch pattern data from said static memory means for a selected stitch pattern for providing a desired stitch position actuator control signal corresponding to a predetermined set of stitch position coordinates in said selected stitch pattern and for digitally

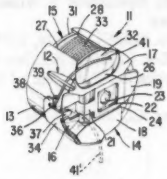
comparing said actual position digital input signal with said selectively processed desired stitch position actuator control signal for said position servo control loop for providing a servo control output signal to said actuator means based on said digital comparison for controllably adjusting said actuator means for providing a stitch at a different set of desired stitch position coordinates in said selected stitch pattern from a previous stitch in said pattern as said sewing machine progresses through said pattern.

4,275,675

BOBBIN CASE WITH THREAD GUIDE FOR CYCLIC SEWING MACHINE

Karl H. Killinger, Dover, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Oct. 3, 1979, Ser. No. 81,405
Int. Cl.³ D05B *57/26*
U.S. Cl. 112—229 **5 Claims**



1. A bobbin case comprising:
a front wall;
a generally cylindrical skirt extending rearwardly from the front wall;
a leaf spring shaped to conform to a limited part of the cylindrical skirt;
a slot extending along the cylindrical skirt from the rear edge thereof towards the front wall and terminating at a location covered by the leaf spring, the slot being wide enough to allow thread to be guided along the slot and under the leaf spring, with a free end of the thread extending from under an edge of the leaf spring;
a needle opening through the cylindrical skirt at a location angularly displaced from the edge of the leaf spring where the thread emerges;
guide means comprising a length of wire shorter than the axial length of the cylindrical skirt and soldered to the exterior surface of the skirt and extending generally parallel to the axis of the cylindrical skirt in a region between the end of the leaf spring and the location of the needle opening; and
a passageway partly formed in the cylindrical skirt under the wire and partly formed in the wire on the side thereof facing the cylindrical skirt to allow the thread emanating from under the leaf spring to be guided through the passageway under the wire to be supported by the wire so as to prevent the end of the thread from drooping to a location in the path of rotation of a rotary hook in which the bobbin case is supported.

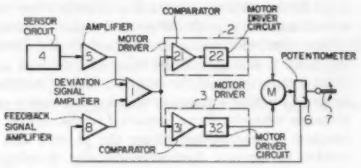
4,275,676

AUTO-STEERING SYSTEM

Michiru Baba, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Mar. 23, 1978, Ser. No. 889,232
Claims priority, application Japan, Mar. 11, 1977, 52-38711[U]; Apr. 5, 1977, 52-41665[U]
Int. Cl.³ B63H *25/00*
U.S. Cl. 114—144 E **4 Claims**

1. An improved auto-steering system, comprising:
(A) a sensor circuit means for detecting changes in environmental conditions and generating electrical signals representative thereof;
(B) a deviation signal amplifier having an output terminal and first and second input terminals, said first input terminal being coupled to said sensor circuit means, for amplifying said signals;
(C) starboard and port motor drivers coupled in parallel with each other and coupled to said output terminal of said deviation signal amplifier, each of said motor drivers comprising a comparator and a motor driver circuit coupled in series and having an output terminal;
(D) a drive motor for a rudder, coupled to said output terminals of said motor drivers;
(E) a potentiometer interposed between said drive motor and said rudder and having an output terminal coupled to said second input terminal of said deviation signal amplifier;
(F) means for adjusting the reference voltages to be applied to said comparators; and



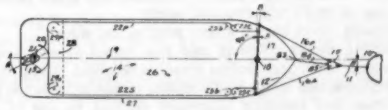
(G) each of said motor drivers being a low-pass filter circuit comprising:
(1) resistor means;
(2) capacitor means, the time constant of said low-pass filter circuit being defined by the resistance of said resistor means and the capacitance of said capacitor means;
(3) an input terminal;
(4) a NOT-gate having an input coupled to said input terminal;
(5) a transistor whose base terminal is coupled to said input terminal, said capacitor means being interposed between the collector and emitter terminals of said transistor;
(6) an element generative of control signals having one input terminal directly coupled to said NOT-gate and having another input terminal coupled, via said resistor means, to said NOT-gate; and
(7) said collector terminal of said transistor being coupled to said other input terminal of said element.

4,275,677

TOW OF BARGES BY TUGS

Arthur J. Nelson, 849 W. Orange, South San Francisco, Calif. 94080

Filed Jan. 2, 1979, Ser. No. 637
Int. Cl.³ B63B *21/56*
U.S. Cl. 114—246 **7 Claims**



1. In a combination comprising:
(a) a tug to impart propulsive force by a towline to a barge having a rudder to maintain barge directional stability with the tug heading; and
(b) a segmented linkage mechanism connecting said towline

and rudder to turn the rudder to an angular deflection from a neutral position when the towline and barge longitudinal alignment deviates;

an improved arrangement affording a simple means to mount the linkage mechanism while providing accomodations to alter member relationship for a rudder response to accommodate conditions encountered, comprising:

(1) a propulsive force transmitting forward segment having a flounder plate connected to the trailing end of said towline to form a vertex connection between the towline and bridle legs connected to the ends of a beam which is pivotally mounted to a structure fixed above the barge deck to impart propulsive force along the barge longitudinal centerline;

(2) a bearing supported rudder stock pivotally mounting the rudder, said stock extending upwardly from the rudder to a rudder quadrant contained in a compartment disposed below said deck;

(3) a pair of aft wires extending from forward end connections with the pivotal beam around horizontally disposed grooved sheave segments within the compartment for an athwartship reach past each other to adjustable connections with the pivotal rudder quadrant;

(4) stops to provide means to transmit towing forces from the beam to one side or the other of the barge and limit pivotal movement of the beam to restrict rudder angularity (A) within a range containing the center of water pressure whereby force imparted to the rudder by said pressure is transmitted along the pivotal axis of the rudder to obviate hydrodynamically developed torsional loading to said mechanism; and,

(5) a pair of vertically spaced grooved sheave segments, each of said aft wires extending around one of said pairs whereby said wires are directed from the above deck location of the beam to a below deck disposition.

4,275,678

COUPLING APPARATUS FOR ARTICULATED BODIES

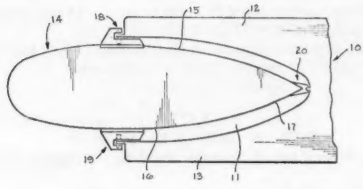
Robert A. Bludworth, P.O. Box 12424, Houston, Tex. 77017

Continuation of Ser. No. 465,147, Apr. 29, 1974, Pat. No. 4,148,270. This application Apr. 9, 1979, Ser. No. 28,183

The portion of the term of this patent subsequent to Apr. 10, 1996, has been disclaimed.

Int. Cl.³ B63B *21/62*

U.S. Cl. 114—248 **43 Claims**



1. A marine push-towing transportation combination comprising:

a first vessel having a notch at one end, said notch having a pair of oppositely disposed wings,

a second vessel having a bow portion and sides,

coupling means coupling said first vessel to said second vessel when said second vessel is received in said notch between said wings, said coupling means including at least three first coupling assemblies secured to one of said vessels, each of said first coupling assemblies including at least one bearing member having opposed, substantially vertical bearing surfaces, one of said first coupling assemblies being disposed for engagement generally forward of said notch, the other two of said first coupling assemblies being disposed for engagement generally rearward and on opposite sides of said notch, and at least three second coupling assemblies secured to the other of said vessels, each of said second coupling assemblies being disposed so as to be engagable with said first coupling assemblies when said second vessel is received in said notch, each of said second coupling assemblies including gripping means for frictionally engaging said bearing surfaces, each of said gripping means comprising first and second gripping members, said first gripping member having a surface engagable with one of said bearing surfaces, said second gripping member having a surface with the other of said bearing surfaces, said first gripping member being mounted for movement in a direction generally transverse to said bearing surfaces, and means for effecting engagement of said gripping means with said bearing surfaces.

4,275,679

FLOATING PLATFORM WITH MONOLITHICALLY FORMED FLOAT MEMBERS AND PLATFORM

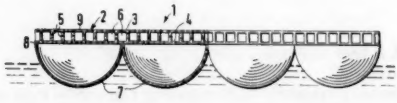
Ulrich Finsterwalder, München-Obermenzing, Fed. Rep. of Germany, assignor to Dyckerhoff & Widmann AG, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 819,054, Jul. 26, 1977, abandoned. This application Oct. 31, 1978, Ser. No. 956,286

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634622

Int. Cl.³ B63B *35/44*

U.S. Cl. 114—264 **21 Claims**



1. A floating platform especially for use at offshore locations where the platform may be exposed to significant wind and wave forces and with the platform having a variable water level depending on the loaded condition of the platform, comprising a platform member, said platform member comprising a concrete slab extending transversely of the vertical direction and extending in two directions transversely of one another with said concrete slab being prestressed, said concrete slab having an upper surface and a lower surface and a plurality of float members arranged in a two-directional pattern subjacent to and supporting said concrete slab, wherein the improvement comprises that said concrete slab is prestressed in each of its two transversely extending directions, the variable water level of the platform being located below said concrete slab, said concrete slab including upwardly extending intersecting concrete partitions reinforcing said slab, said slab including said partitions comprising a unitary construction free of joints, said float members formed monolithically with and rigidly attached directly to the lower surface of said concrete slab and being completely closed, said float members are hollow so that each forms a chamber therein and is formed of one of reinforced concrete and prestressed concrete and is shaped at least in part of a closed body of revolution with a curved generatrix and with the water level of the platform located in the range of said float members spaced downwardly from said concrete slab and the lower surface of said concrete slab forming a closure for the upper end of the chamber within each of said hollow float members, means in said concrete slab affording access through the closure of said float members into the chambers therein said float members in the two-directional pattern located directly below and extending across in both directions of the lower surface of said concrete slab and being arranged in adjacent side-by-side rows with said float members being uniformly distributed so that each said float member is located directly below and supports a corresponding uniform part of said concrete slab and in the range of the variable water level said float members being spaced apart in the horizontal direc-

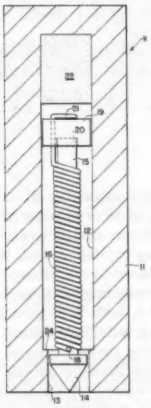
tion in the two directions of the two-directional pattern with the horizontal area of each said float members at the water level being significantly less than the horizontal base area of said concrete slab below which said float member is directly located.

4,275,680

ANCHORING SYSTEM

John W. Pennington, III, Spotsylvania, and Kenneth G. Thorsted, Fredericksburg, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 31, 1979, Ser. No. 71,468
Int. Cl.³ B63B *21/28*
U.S. Cl. 114—295 **3 Claims**



1. An anchoring system for embedding an anchoring wire in a surface which may be remotely controlled and which may be employed in any environment comprising:

a charge housing having a central bore therein, one end of which communicates with the exterior of said housing;

a pointed anchor body disposed within said bore, said anchor body being hollow and having inner and outer ends;

a pusher plate abutting the inner end of said anchor body;

a coiled wire disposed within said anchor body, said wire directly attaching said anchor body to said pusher plate;

an explosive charge disposed within said bore behind said pusher plate for driving said pusher plate down the bore to eject said anchor body when said explosive charge is initiated; and

means formed at the open end of said bore for stopping movement of said pusher plate while said anchor body continues on to embed itself under its own momentum whereby said coiled wire will unwind and said charge housing will be firmly anchored.

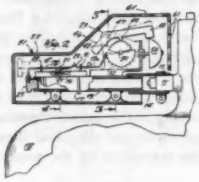
4,275,681

SYSTEM GAS ALARM

Soman Ragavan, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Dec. 10, 1979, Ser. No. 102,022
Int. Cl.³ F17C *13/02*; G01L *19/12*
U.S. Cl. 116—70 **2 Claims**

1. A gas alarm, comprising in combination, a tube affixed by a socket on the outlet of a safely valve of a gas cylinder, a plug sealingly mounted in the outlet end of said tube, including a trigger arm connected to the outer end of said plug, a rotatable spring motor drive unit retained by said trigger arm when said plug is in said tube in combination with means for releasing said unit from said arm responsive to movement of said plug from said tube wherein said means comprise a platform clamped to said tube including bearings in which said trigger arm is rotatably supported a spur on said trigger arm slidably fitting in a retaining groove in said platform, and a tension spring urging said trigger arm to rotate, said groove retaining said arm against rotation wherein said drive unit includes a ratchet



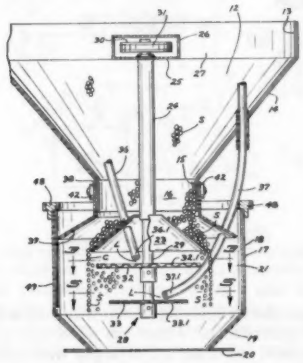
wheel retained by said trigger arm in further combination with a lever having escapement teeth engaging said toothed wheel, and a hammerhead on said lever adapted to strike a bell when said when said wheel rotates, said trigger arm having an end portion eccentric to the trigger arm axis in contact with said wheel, whereby trigger arm rotation releases said wheel for rotation.

4,275,682

PEANUT SEED TREATING MACHINE

Joseph A. Weber, Arlington, Tex., assignor to Gustafson, Inc., Dallas, Tex.

Filed Mar. 10, 1980, Ser. No. 129,031
Int. Cl.³ B05C *5/00*
U.S. Cl. 118—303 **6 Claims**



1. A treating machine for applying liquid chemical treatment to peanut seeds and the like, comprising

seed supply means having a restricted outlet throat through which seeds are allowed to flow by gravity,

a housing beneath the throat defining a seed treating chamber having a top inlet and a bottom outlet for the seeds, the throat directing the seeds into the treating chamber,

seed directing means in the treating chamber and beneath the throat in confronting relation thereto, the seed directing means establishing an annular curtain of falling and revolving seed in the treating chamber,

a pair of supply ducts extending into the treating chamber and directing streams of the liquid chemical treatment therein,

a high speed rotor in the treating chamber and revolving on a vertical axis, the rotor being located beneath the seed

directing means and thereby embraced by the annular curtain of free falling seeds, and the rotor having a pair of vertically spaced upper and lower spinning discs each beneath the delivery end of a respective supply duct to receive the stream and sling the liquid chemical treatment outwardly onto the falling seeds,

the upper disc having a diameter larger than the diameter of the lower disc and having radial flutes which are substantially deeper in an axial direction than the flutes in the lower disc, whereby the upper disc breaks up the liquid chemical treatment into finer mist particles and produces a more intense whirling and turbulent motion of the treatment mist and air than does the lower disc, for applying a first light coating of the liquid chemical treatment on the seed adjacent the upper disc and then a second heavier coating of the treatment on the seed adjacent the lower disc.

4,275,683

APPARATUS FOR APPLYING FOAM TO A MOVING WEB

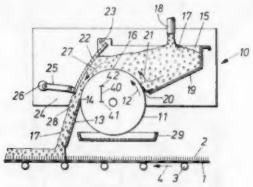
Johannes Kutz, St. Tönis; Walter Keller, Willich; Max Krüger, Krefeld, and Eduard Küsters, Gustav-Fünders-Web 18, 4150 Krefeld, all of Fed. Rep. of Germany, assignors to Eduard Küsters, Krefeld, Fed. Rep. of Germany

Filed Sep. 20, 1979, Ser. No. 76,988

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1979, 2915289

Int. Cl.³ B05L *5/02*

U.S. Cl. 118—407 **16 Claims**



1. In apparatus for applying foam to a moving web comprising a foam generator and a foam box which is coupled to the foam generator, the foam box arranged transversely to the web, extending over its width, and having on its underside an opening which extends over the width of the web and under which rotatable cylinder means is arranged which extends over the width of the web, the cylinder means being sealed against the foam box except for an exit for the foam, said cylinder means in its rotation, carrying foam from the foam box along at its surface and depositing it on the web passing underneath the cylinder means, the improvement comprising:

(a) a wall element disposed on the side of the cylinder means which is descending during revolution, said wall element, together with the cylinder means, forming a canal which is tapered in the circumferential direction of the cylinder means said canal ending in the region between the height of the axis of the cylinder means and one half the height of the cylinder means above; and

(b) a wiper inclined downwardly toward the web resting against the cylinder means below the end of said canal.

4,275,684

ANIMAL LITTER

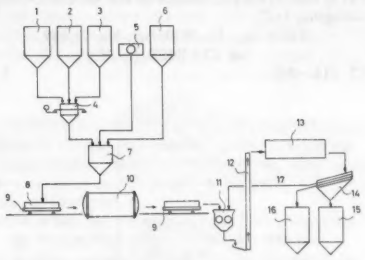
Walter Krämer, Soltau-Friedrichseck, and Rainer Follmann, Minden, both of Fed. Rep. of Germany, assignors to Effem GmbH, Verden, Fed. Rep. of Germany

Filed Jan. 16, 1980, Ser. No. 112,524

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1979, 2902079

Int. Cl.³ A01K *1/015*

U.S. Cl. 119—1 **4 Claims**



1. An animal litter consisting of or containing a porous calcium silicate granulate or powder having pore radii of less than 500μ, said calcium silicate granulate or powder being prepared by reacting crystalline and, if required, amorphous silicon dioxide, or materials containing the same, with calcium oxide or materials containing the same, in a CaO to SiO_2 molar ratio of 0.8:1 to 1.1:1, with homogenization thereof in water followed by molding, autoclave setting, comminuting, drying and grading with the further proviso that homogenization during the reaction has been carried out by dispersing the solid starting materials in water with the addition of an anion-active surfactant previously converted in water to a microporous stable foam.

4,275,685

APPARATUS FOR THE HANDLING OF SHEEP

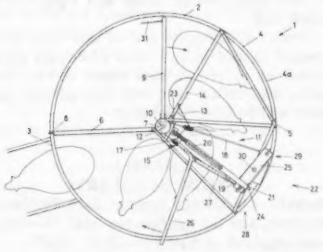
Donald L. Hopkins, Heywood, Australia, assignor to Alf Hannaford & Co. Pty. Ltd., Beverley, Australia

Filed Mar. 6, 1980, Ser. No. 127,757

Claims priority, application Australia, Mar. 7, 1979, PD7940

Int. Cl.³ A01K *29/00*

U.S. Cl. 119—20 **6 Claims**



1. An arrangement for handling sheep characterised by including a pen providing a circular restraining outer barricade, an inlet and an outlet spaced apart from the inlet in each case being for sheep to pass through the said outer barricade, a first movable barricade supported and adapted so that in a first selected position, the said movable barricade will extend between and act as a barricade for sheep between a centre of the pen and one side of the outlet, and, in a second position, the

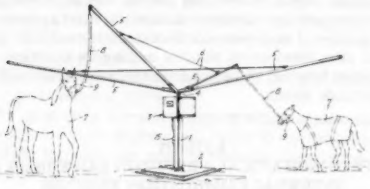
said movable barricade will extend between and act as a barricade for sheep between a centre of the pen and the other side of the outlet, a second movable barricade with one end supported at a centre of the pen and the barricade otherwise being supported so that the barricade is adapted to move while in a radial alignment relative to the circular shape of the outer barricade, behind sheep retained within the outer barricade being urged to pass through the outlet, and drive means adapted to urge the said second movable barricade in a direction while aligned radially to rotate about its axial support located at the centre of the pen and otherwise supported and select so as to urge sheep through the open outlet.

4,275,686

HORSE EXERCISER DRIVE MECHANISM

John A. MacGillivray, 14205 - 119th Northeast, Kirkland, Wash. 98033

Filed Apr. 25, 1979, Ser. No. 33,212
Int. Cl.³ A01K *15/02*
U.S. Cl. 119—29 **3 Claims**



2. In an exerciser including a rotatable member for inducing movement of an animal at a speed corresponding to the speed of rotation of such rotatable member and a motor having a rotary drive shaft for driving the rotatable member, the improvement comprising variable speed ratio speed-reducing mechanism connected between the motor drive shaft and the rotatable member, speed-reducing control means manipulatable while the motor is driving the rotatable member for adjusting the speed ratio of said speed-reducing mechanism, a constant speed ratio gearbox connected to said variable speed ratio speed-reducing mechanism, variable friction drive means connected between said constant speed ratio gearbox and the exerciser rotatable member, and drive torque adjusting means for adjusting said variable friction drive means for altering the maximum torque transferrable to the exerciser rotatable member from the motor drive shaft.

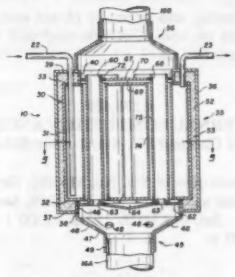
4,275,687

PREHEATING UNIT FOR DOMESTIC HOT WATER SUPPLY

Jack S. Sasaki, 3231 Wellington Ave., Vancouver, British Columbia, Canada

Filed Oct. 29, 1979, Ser. No. 88,924
Claims priority, application Canada, Oct. 31, 1978, 315250
Int. Cl.³ F22B *33/00*
U.S. Cl. 122—20 B **6 Claims**

1. A preheating unit comprising a water tank having a bottom, side and top walls; a cold water supply pipe and a warm water delivery pipe connected to the tank, a casing enclosing the tank and having a side wall spaced from the side wall of the tank to provide a substantially annular space therebetween, a plurality of inner tubes extending longitudinally through the tank, an outer tube secured to the bottom and top wall to enclose each inner tube, said inner and outer tubes being spaced apart to provide annular spaces between said tubes, a lower adaptor on the casing for connecting a first pipe section to the pipe in communication with the inner tubes, and an upper adaptor on the casing for connecting a second pipe



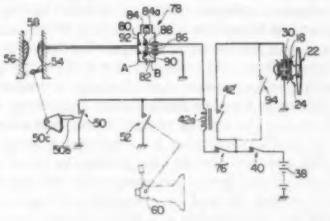
section to the tank in communication with both the inner tubes and the annular spaces.

4,275,688

COOLING SYSTEM FOR INTERNAL COMBUSTION ENGINE

Fumiyuki Abe, and Yoshimasa Hayashi, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Division of Ser. No. 882,642, Mar. 2, 1978, Pat. No. 4,222,353.
This application Oct. 3, 1979, Ser. No. 81,317
Claims priority, application Japan, May 6, 1977, 52-1265; Aug. 24, 1977, 52-100576
Int. Cl.³ F25B *27/00*; B60H *3/04*
U.S. Cl. 123—41.12 **20 Claims**



1. A cooling system for an internal combustion engine having a crank shaft, an electric source and a throttle valve and adapted for propelling a vehicle having a gear box with a plurality of gear ranges, the system comprising:

a cooling fan for cooling the engine when rotatably driven;

means for selectively rotatably driving said cooling fan from the engine crank shaft, said driving means including a normally engaged and selectively disengageable clutch, and

means, including a normally closed switch, for maintaining said clutch in its normally engaged condition; and

means for disengaging said clutch during engine acceleration under an urban area cruising condition of the vehicle propelled by the engine, said disengaging means comprising:

means for detecting a first engine operating condition which is a high load and low vehicle speed engine operating condition, said detecting means including a throttle position switch arranged to open when the engine throttle valve opens over a predetermined amount representing the high load engine operating condition, and a gear position switch electrically connected in parallel with said throttle position switch and arranged to open when the gear range in the gear box is selected in a predetermined

position representing the low vehicle speed operating condition;

means for detecting a second engine operating condition; and

means for opening said normally closed switch in response to detection of both said first and said second engine operating conditions.

4,275,689

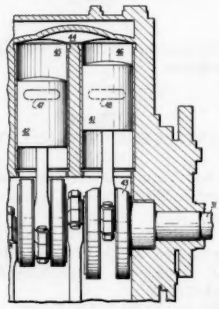
INTERNAL COMBUSTION ENGINE

Earl L. Ray, 113 Chestnut Pl., Rte. 2 - Box 393.A, Arden, N.C. 28704

Continuation-in-part of Ser. No. 814,662, Oct. 27, 1977, abandoned. This application Feb. 12, 1979, Ser. No. 11,425

Int. Cl.[3] **F02B** *25/12, 17/00*

U.S. Cl. 123—53 B **6 Claims**



1. A two cycle internal combustion engine having first and second adjacent cylinders, said first cylinder having an intake port connected to receive a lean mixture of fuel and air, said second cylinder having an exhaust port for delivering combustion products from said cylinder, first and second pistons located within said cylinders, a crank shaft for connecting each of said pistons to a power shaft, further comprising a cylinder head for sealing the tops of said cylinders, said cylinder head having an auxiliary chamber for receiving a timed pulsating fuel stream, a second chamber for joining the top of said cylinders into which said first piston compresses said lean mixture of fuel, a connecting channel for connecting said auxiliary chamber to said second chamber at a point between said cylinders, and means for sequentially igniting the fuel in said auxiliary chamber whereby a flame is produced for igniting a lean mixture of fuel and air in said second chamber, said first and second pistons having a relative timing whereby compressed gases in said second chamber are motivated during ignition thereof between the tops of said pistons communicating with the flame from said connecting channel spreading the flame from said auxiliary chamber through said second chamber.

4,275,690

IGNITION DISTRIBUTOR

Yukitsugu Fukumori, and Masazumi Sone, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jun. 22, 1979, Ser. No. 50,808

Claims priority, application Japan, Jul. 10, 1978, 53-82934

Int. Cl.[3] **F02P** *1/00;* **H04R** *17/00*

U.S. Cl. 123—146.5 A **12 Claims**

1. An ignition distributor for use in an internal combustion engine, comprising:

(a) an input terminal for connection to a high voltage source;

(b) a plurality of output terminals for connection to ignition plugs, respectively;

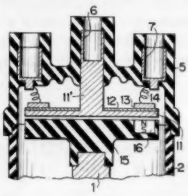
(c) first electrode means electrically connected to said input terminal or said output terminals;

(d) piezo-conductive plate means placed on said first electrode means;

(e) second magnetic electrode means placed on said piezo-conductive plate means;

(f) means for electrically connecting said second magnetic electrode means to said output terminals or said input terminal; and

(g) a rotor disposed to face said first electrode means and



provided at its one end with a magnet, said rotor adapted to rotate with rotation of said engine to bring said magnet below said second electrode means so that when said magnet comes below said second electrode means, it attracts said second electrode means to exert a pressure on a portion of said piezo-conductive plate means to render the same conductive, thereby making an electrical connection between said second electrode means and said first electrode means.

4,275,691

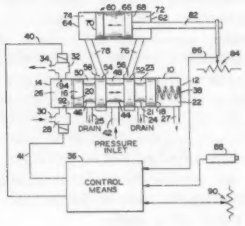
ELECTROMECHANICAL PRECISION GOVERNOR FOR INTERNAL COMBUSTION ENGINES

George D. Wolff, and Michael S. Ziemacki, both of P.O. Drawer 9407, Winter Haven, Fla. 33880

Filed Feb. 5, 1979, Ser. No. 9,260

Int. Cl.[3] **F02B** *3/00, 33/00*

U.S. Cl. 123—352 **29 Claims**



1. An electronically controlled, hydraulically actuated precision governor for controlling the operating RPM of a diesel engine by repositioning the rack of the engine fuel injection pump in response to changes in engine RPM, said governor comprising:

(a) a main chamber having first and second end surfaces;

(b) a piston slideably positionable about a neutral location within said main chamber and having first and second faces;

(c) biasing means positioned between the first end surface of said chamber and the first face of said piston for biasing said piston toward the second end surface of said main chamber;

(d) an unpressurized chamber positioned within said main chamber between the first end surface thereof and the first face of said piston;

(e) a variable pressure control chamber positioned within said main chamber between the second end surface thereof and the second face of said piston;

(f) an equilibrium pressure within said control chamber which defines said neutral location of said piston;

(g) first electrically controllable valve means coupled to said control chamber and to a source of pressurized fluid for metering fuel into or out of said control chamber to regulate the pressure in said control chamber above or below said equilibrium pressure in response to a control signal to controllably dis,place said piston toward either the first or second end surfaces of said main chamber;

(h) an inlet port positioned in said main chamber between the first and second faces of said piston and coupled to the source of pressurized fluid;

(i) actuator means hydraulically coupled to said main chamber between the first and second faces of said piston for displacing the rack of the fuel injection pump in response to fluid presssure from said main chamber;

(j) second valve means coupling said main chamber to said actuator means when said piston is not in said neutral location and conducting pressurized fluid from said inlet port to said actuator means to displace said actuator means in a first direction when said piston is displaced toward the first end surface of said main chamber and for displacing said actuator means in a second direction when said piston is displaced toward the second end surface of said main chamber; and

(k) control means coupled to the rack of the fuel injection pump and to said first valve means, including

(i) RPM sensor means for measuring the operating RPM of the engine and

(ii) RPM command means for designating a selected engine operating RPM

for generating the control signals which actuate said first valve means to displace said piston to reposition the rack of the fuel injection pump to maintain the selected engine operating RPM.

4,275,692

SYSTEM FOR CONTROLLING IGNITION TIMINGS IN ENGINE

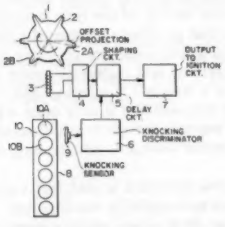
Yuji Takeda; Takashi Shigematsu, and Daisaku Sawada, all of Shizuoka, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Aug. 10, 1979, Ser. No. 65,756

Claims priority, application Japan, Aug. 15, 1978, 53-99669

Int. Cl.³ F02P 5/14

U.S. Cl. 123—419 **13 Claims**



1. An ignition timing control system for an engine having a plurality of cylinders comprising:

first means for generating first ignition signals in synchronism with the rotation of the engine;

second means for generating second ignition signals advanced by a predetermined value with respect to at least some of said first ignition signals;

means, responsive to said first and second ignition signals, for applying said first signals and for selectively applying said second signals, instead of said first signals;

means for detecting knocking; and

means for altering the timing of said first ignition signals, and therefore said second ignition signals, in response to said detecting means.

4,275,693

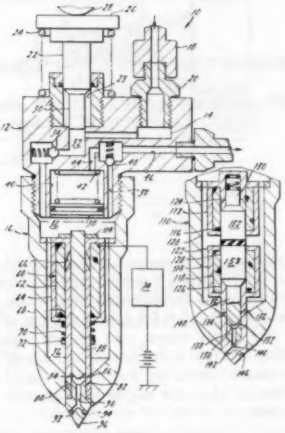
FUEL INJECTION TIMING AND CONTROL APPARATUS

William H. Leckie, 3 Hickory Hollow, Birmingham, Mich. 48010

Continuation of Ser. No. 862,739, Dec. 21, 1977, abandoned. This application Nov. 13, 1979, Ser. No. 93,172

Int. Cl.³ F02M 51/06

U.S. Cl. 123—447 **3 Claims**



1. An electrically controlled liquid fuel injector for converting a conventional pressure excited fuel injector system of a diesel internal combustion engine to a non-pressure excited injection system, said injector comprising an injector housing adapted to be mounted in the space and position of said conventional pressure excited fuel injector in direct communicating relationship with the combustion chamber of said diesel internal combustion engine, a variable volume fuel accumulator in said housing, said accumulator including means for maintaining the pressure of liquid fuel therein relatively constant incident to changes in the volume of fuel in said accumulator, a fuel pump in said housing comprising a piston adapted to be mechanically driven directly by said engine in direct relation to the speed of rotation thereof for pressurizing fuel in said accumulator, a fuel injection nozzle communicating with said accumulator and the combustion chamber of said diesel internal combustion engine, a fluid flow control valve mechanically and functionally independent from said fuel pump and having fluid flow control ports communicating directly with said accumulator and said injection nozzle for controlling the flow of fuel from said accumulator to said injection nozzle, said valve being movable between an open and closed position independently of the pressure of the fuel in said accumulator, an electric solenoid for controlling movement of said valve independently of the pressure of the fuel in said accumulator, and means for energizing said solenoid independently of said fuel pump and pressure in said accumulator in response to selected engine and environmental parameters.

4,275,694

ELECTRONIC CONTROLLED FUEL INJECTION SYSTEM

Hatsuo Nagaishi, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 4, 1979, Ser. No. 72,436

Claims priority, application Japan, Sep. 27, 1978, 53-118848

Int. Cl.³ F02M 41/00

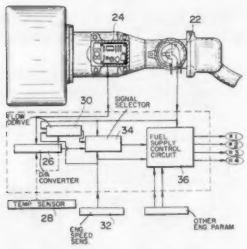
U.S. Cl. 123—463 **5 Claims**

1. A fuel supply system for use in an internal combustion

engine having an intake passage and a throttle valve therein, said system comprising:

(a) means for supplying a controlled amount of fuel to said engine in accordance with intake air flow rate;

(b) a Karman's vortex flow meter located in said intake passage upstream of said throttle valve for providing a first signal corresponding to the rate of air flow through said intake passage;



(c) means, responsive to engine rotational speed and throttle position, for providing a second signal corresponding to the rate of air flow through said intake passage; and

(d) a signal selector means for connecting one of said signals to said fuel supply means, said selector means normally connecting said first signal to said fuel supply means, said selector means connecting said second signal to said fuel supply means when the engine load exceeds a predetermined value.

4,275,695

DEVICE FOR DETERMINING A FUEL METERING SIGNAL FOR AN INTERNAL COMBUSTION ENGINE

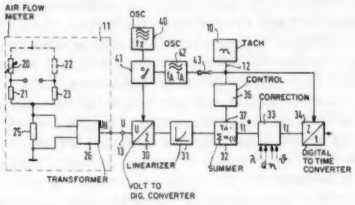
Hartmut Bauer, Gerlingen; Peter Schmidt, Schwieberdingen, both of Fed. Rep. of Germany; Herbert Stocker, San Jose, Calif., and Bernd Przybyla, Schwieberdingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 11, 1979, Ser. No. 74,450

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1978, 2840793

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—486 **19 Claims**



1. A device for determining a fuel metering signal in an internal combustion engine according to engine parameters having an intake manifold and a crankshaft, wherein the device includes: a tachometer connected to measure engine rpm; an air flowmeter mounted in the air intake manifold which generates voltages such that the voltage amplitude is proportional to air flow in the intake manifold, a storage means connected to the air flowmeter to store the voltages, a time counting circuit connected to the storage means such that the voltages are stored according to a first predetermined time interval, further including:

a summing element connected to the storage means for summing the stored voltages, further connected to detect crankshaft rotation and connected to the time counting circuit which generates a second predetermined time interval wherein the summing element multiplies the stored voltages with the second predetermined time interval during a predetermined crankshaft angle and wherein the summing element generates an output indicative of fuel metering time.

19. A method of determining a fuel metering signal for an internal combustion engine having an intake manifold, comprising the steps of:

generating first signals proportional to the speed of the engine;

generating second signals proportional to instantaneous air flow in the intake manifold;

converting the second signals to digital signals;

making the digital signals linear;

integrating said linearized signals over a time period equal to at least one crank shaft revolution; and

converting said integrated signals to a time signal dependent upon said first signals to provide the desired fuel metering signal.

4,275,696

CARBURETOR OUTER VENT CONTROL DEVICE

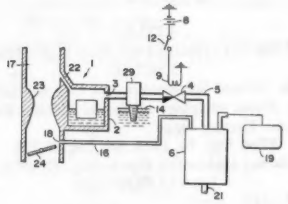
Toshiro Yoshida, and Teruo Kumai, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Division of Ser. No. 836,393, Sep. 26, 1977, Pat. No. 4,208,997. This application Feb. 8, 1980, Ser. No. 119,762

Claims priority, application Japan, May 9, 1977, 52/53519

Int. Cl.³ F02M *33/02*

U.S. Cl. 123—519 **1 Claim**



1. A carburetor outer vent control device for use in a fuel system of a motor vehicle of the type including an engine, an outer vent provided in a float chamber of a carburetor, a charcoal canister and a fuel vapor line coupling said outer vent to said charcoal canister, said carburetor outer vent control device comprising a means for opening and closing said fuel vapor line such that said line is only open when an excessive amount of fuel vapor is present in said float chamber and said engine of said motor vehicle is not running, said means comprising:

a solenoid valve provided in said fuel vapor line which is closed when said engine is running; and

a heat sensitive valve means which is open when a temperature of said engine is higher than some predetermined temperature.

4,275,697

CLOSED LOOP AIR-FUEL RATIO CONTROL SYSTEM

Donald D. Stoltman, Henrietta, N.Y., assignor to General Motors Corporation, Detroit, Mich.

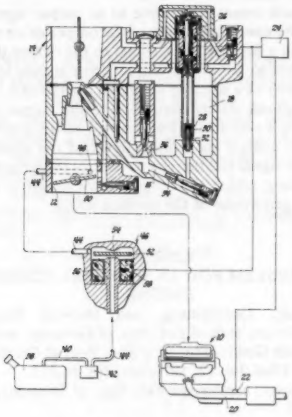
Filed Jul. 7, 1980, Ser. No. 165,971

Int. Cl.³ F02M *7/20*

U.S. Cl. 123—520 **1 Claim**

1. A closed loop air-fuel ratio control system for an engine having an air induction passage for receiving a flow of air, a main fuel passage for receiving a flow of liquid fuel, and a purge passage for receiving fuel vapor and air from a fuel

vapor storage region, said engine being effective to combine the fluids received through said passages into an air-fuel mixture, said air-fuel ratio control system comprising the combination of means responsive to the air-fuel ratio of said mixture for producing a signal indicative of the fuel flow required to provide a desired air-fuel ratio, a metering valve in said main fuel passage, said metering valve being responsive to said signal for varying fuel flow through said fuel passage generally linearly with said signal, and a purge valve in said purge passage, said



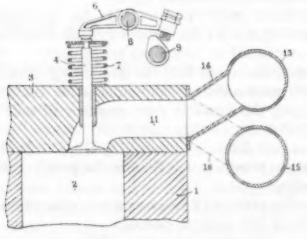
purge valve being responsive to said signal for minimizing flow through said purge passage when said signal approaches its maximum and its minimum values and for maximizing flow through said purge passage when said signal is intermediate its maximum and minimum values, whereby fuel vapor purged from said region is used to provide the desired air-fuel ratio only when fuel vapor purged from said region cannot unduly enrich said mixture and air purged from said region cannot unduly lean said mixture.

4,275,698

INTERNAL COMBUSTION ENGINE OF THE TYPE HAVING TWO INLET VALVES PER CYLINDER

Andre Dennetiere, Saint Saulve, France, assignor to Duvant, S.A., Paris, France

Continuation of Ser. No. 635,913, Nov. 28, 1975, abandoned. This application May 3, 1978, Ser. No. 902,356
Claims priority, application France, Dec. 3, 1974, 74 39487
Int. Cl.³ F02M *21/02*
U.S. Cl. 123—527 **8 Claims**



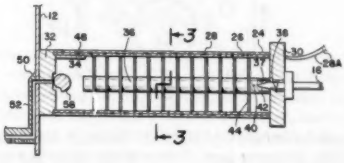
1. An internal combustion engine comprising (a) a cylinder block; (b) at least one cylinder in said cylinder block; (c) a cylinder head having first and second inlet ports opening into said at least one cylinder, at least one induction passage, and first and second induction ducts formed in said at least one induction passage, each induction duct being connected with one of said inlet ports; (d) first and second inlet valves, each inlet valve being adapted to close one of said inlet ports, said second inlet valve being a cylindrical shutter-type valve; (e) a single rocker for actuating simultaneously said first and second inlet valves; and (f) first and second induction manifolds, each induction manifold being connected to one of said induction ducts, said first induction manifold being connected to a source of air, and said second induction manifold being detachably connected to a source of gaseous fuel.

4,275,699

GASOLINE VAPOR COMPLETE BURNING CARBURETOR

Jerry D. Troglin, Rte. 1, Box 107, Locust Grove, Okla. 74352

Filed Jul. 23, 1979, Ser. No. 59,531
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **7 Claims**



1. A fuel vaporizing device for use in combination with a carburetor and comprising heater means interposed between the carburetor and a supply of fuel for receiving raw fuel therein and selectively increasing the temperature of the fuel, the heater means comprising inner and outer concentrically arranged housings having electrical heating coil means interposed therebetween for transmitting heat to the inner housing for heating of the interior thereof, a plurality of annular fins disposed within the inner housing and each fin having the outer periphery thereof in engagement with the inner periphery of the housing for receiving heat therefrom rod means centrally disposed within the housing and extending longitudinally therein through each of the fins for supporting thereof, an internal chamber provided in one end of the rod means and in open communication with the supply of fuel for receiving the fuel therein, said chamber being provided with a plurality of spaced apertures for injecting the fuel into the interior of the inner housing in a jet action, each of said fins being provided with a plurality of spaced apertures disposed in misalignment with the apertures of the adjacent fins to provide a tortuous path of travel of the fuel for facilitating braking down of the fuel into small particles and for increasing the heating thereof to assure vaporization of the fuel within the interior of the inner housing, and orifice means providing communication between the heater means and the interior of the carburetor for discharging the vaporized fuel into the air stream moving through the carburetor.

4,275,700

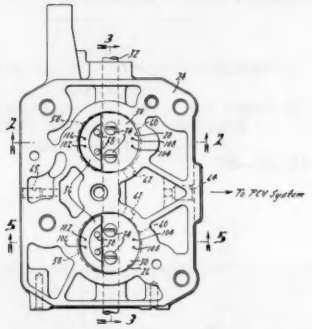
THROTTLE BODY HAVING A DEFLECTOR FOR THE THROTTLE BLADE AND IMPROVED ATOMIZATION

Kenneth A. Graham, Birmingham, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Feb. 21, 1979, Ser. No. 13,337
Int. Cl.³ F02M *29/00*
U.S. Cl. 123—590 **4 Claims**

1. In a throttle body assembly having a throttle body, a circular induction port extending through said throttle body, and a generally circular flat throttle blade disposed in said port and mounted on a rotatable throttle shaft which extends centrally transversely across the port for selectively throttling same and selectively positionable between a closed position

and a fully open position, the improvement which comprises a deflector element disposed on that half of the upstream face of the throttle blade which swings upstream as the throttle blade is increasingly opened from the closed position, said deflector element comprising a flat base disposed against the upstream face of the throttle blade, a thin web forming a portion of said base, and an arcuately extending deflector segment raised relative to said web and comprising a deflection surface which extends arcuately along a segment of the circumferential mar-



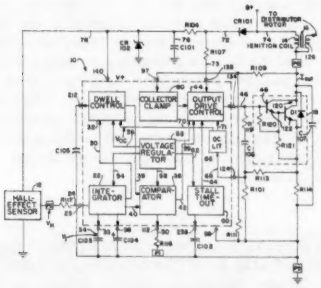
gin of said half of the throttle blade but stops short of the other half of the upstream face of the throttle blade and in a radial section with the blade in the closed position inclines radially inwardly in the upstream direction, aperture means in said web and throttle blade, and fastening means disposed in said aperture means securing said deflection element to the throttle blade said assembly also including means for directing a jet of fuel to impinge upon the deflection surface when the throttle blade is within a certain range of open positions adjacent the closed position.

4,275,701

IGNITION CONTROL SYSTEM

Leonard E. Arguello, San Jose, and Lawrence M. Blaser, Mountain View, both of Calif., assignors to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Apr. 26, 1979, Ser. No. 33,667
Int. Cl.³ F02P 9/00
U.S. Cl. 123—609 **12 Claims**



1. An ignition control system for connection between (1) sensing means for repetitively producing a timing signal in response to rotation of distributor means and (2) output drive means responsive to a repetitively generated activation signal for repetitively supplying an ignition signal to activate ignition means at the repetition period of the ignition signal, the ignition control system comprising:

integrating means responsive to the timing signal for producing a waveform;

dwell-control means for producing a dwell-control reference signal;

comparing means responsive to the waveform and to the dwell-control reference signal for producing an output drive-control signal when the voltage of the waveform equals or is less than the voltage of the dwell-control reference signal;

output drive-control means responsive to the output drive-control signal for generating the activation signal to activate the output drive means;

first feedback means responsive to an output signal indicative of the operational state of the output drive means for supplying a first feedback signal to the output drive-control means to cause the output drive means to stabilize temporarily at a selected activated operational state; and

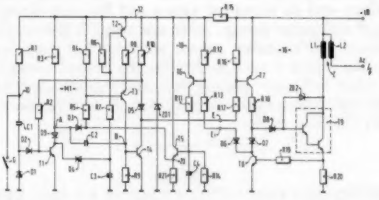
second feedback means responsive to the output signal for supplying a second feedback signal to the dwell-control means to control the voltage level of the dwell-control reference signal and thereby to control the length of dwell time during which the output drive means is activated prior to generation of the ignition signal.

4,275,702

IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Werner Jundt, Ludwigsburg, and Herman Roozenbeek, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 12, 1979, Ser. No. 56,962
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1978, 2833435
Int. Cl.³ F02P 3/04
U.S. Cl. 123—610 **5 Claims**



1. An ignition system for an internal combustion engine including

an ignition coil (Z) having primary (L1) and secondary (L2) windings;

an ignition control transistor (19) serially connected to the primary winding;

an input transducer (G) coupled to the engine and generating engine speed-related signals;

a monostable multivibrator (M1) for generating ignition control signals for the control transistor (19) connected to and controlled by said input transducer;

an integrating circuit (18) for generating integrator output signals connected to said monostable multivibrator for changing the unstable time constant of said monostable multivibrator;

and a current limiting circuit (T8, D6, D7, R19, R20) connected to sense current flow in the primary winding (L1) including

a measuring resistor (R20) connected in the primary winding circuit of said ignition coil (Z),

and a current limiting transistor (T8) connected to and controlled by current flow through said measuring resistor and having a control output (Ei) connected to affect control current applied to the ignition control transistor (T9) to reduce current flow therethrough when the current through said measuring resistor (R20) reaches a predetermined value;

and wherein the control output (Ei) of said current limiting transistor is further connected to and controls said integrating circuit (18) to thereby control the integrator output signal in accordance with current flow through the primary winding of the ignition coil.

4,275,703

FLUX CONTROL SYSTEM FOR A HALL GENERATOR IN AN IGNITION SYSTEM OF AN INTERNAL COMBUSTION ENGINE

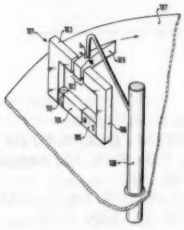
Bernd Bodig, Leinfelden; Herman Roozenbeek, Schwieberdingen, and Werner Jundt, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 24, 1979, Ser. No. 69,622

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1978, 2842386

Int. Cl.³ F02P *3/04*

U.S. Cl. 123—617 4 Claims



1. In an ignition system of an internal combustion engine having a shaft, said ignition system having spark creating means (6, 11) requiring a predetermined value of ignition current flowing therethrough for creating a spark, electronic interrupter switch means (9) connected to said spark creating means for, respectively, allowing and blocking ignition current flow therethrough in response to a first and second switch control signal applied thereto, threshold circuit means (47) having a cut-in threshold and a cut-out threshold for furnishing a first and second threshold output signal when a threshold input signal applied thereto becomes, respectively, greater than said cut-in threshold and less than said cut-out threshold and means (33, 29, 24, 18) for applying said first and second switch control signal to said electronic switch means in response to said first and second threshold output signal, respectively:

improved means for generating said threshold input signal comprising

Hall generator means (59) for furnishing a Hall generator output signal varying as a function of magnetic flux applied thereto;

magnetic circuit means (103–106) coupled to said Hall generator means for applying said magnetic flux thereto;

means (108, 109) for slowly changing the flux through said magnetic circuit means and thereby through said Hall generator means while said shaft of said engine rotates through a predetermined angle of rotation, thereby creating a time-varying Hall generator output signal; and

a linear amplifier (58) interconnected between said Hall generator means and said threshold circuit means for furnishing a threshold input signal corresponding to said Hall generator output signal to said threshold circuit means.

4,275,704

APPARATUS FOR CENTRAL HEATING

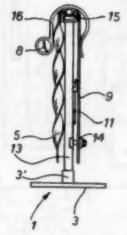
Constant Vuissoz, 3941 Grone, Suisse, Switzerland

Filed Nov. 24, 1978, Ser. No. 963,347

Claims priority, application Switzerland, Dec. 16, 1977, 15490/77

Int. Cl.³ F24C *3/04;* F24H *1/20*

U.S. Cl. 126—92 R 6 Claims



1. In combination with a furnace comprising a fire-box constituting a combustion chamber having floor, and heat exchange surfaces having one face exposed to combustion gases and an opposite face exposed to a fluid to be heated, and a fuel oil burner the flame of which is directed horizontally into said fire-box, means for improving combustion comprising support means in said fire-box and a plurality of juxtaposed elements which are supported by said support means inside said fire-box spaced from said heat exchange surfaces and in the path of said flame, said support means comprising spaced uprights having bases resting on the floor of said fire-box and cross-pieces extending between and connecting said uprights, and said elements comprising strips of stainless steel at least some of which are twisted, said strips being individually supported by said support means in position to be completely surrounded by combustion gases and to be heated to incandescence by said flame.

4,275,705

TWO-STAGE HEAT EXCHANGER

Orland O. Schaus, Agincourt, and John C. K. Overall, Toronto, both of Canada, assignors to Canadian Gas Research Institute, Don Mills, Canada

Filed Jan. 28, 1980, Ser. No. 115,645

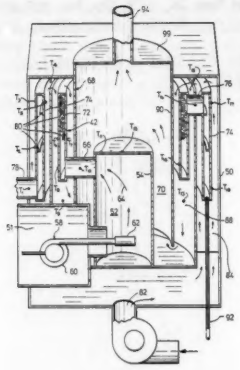
Claims priority, application Canada, Mar. 15, 1979, 323485

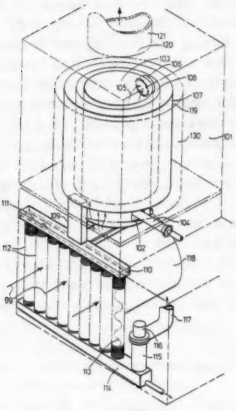
Int. Cl.³ F24H *3/02;* F16F *1/34;* F24B *7/00*

U.S. Cl. 126—110 R 31 Claims

1. A furnace comprising an exterior housing having air distribution means for discharging air heated by said furnace; a primary heat exchanger comprising a central combustion chamber having a top and a bottom and at least one sidewall for burning a fluid fuel yielding hot gaseous products of combustion positioned within said housing; a secondary heat exchanger in communication with said combustion chamber and adapted to receive air in turbulent flow thereabout, for receiving hot gaseous products of combustion from the combustion chamber; means substantially enclosing the sidewall of said combustion chamber intermediate the said combustion sidewall and at least a portion of the secondary heat exchanger and spaced therefrom defining a restricted flow path for turbulent passage of air about said combustion chamber and secondary heat exchanger and shielding the said portion of the secondary heat exchanger from radiation from the combustion chamber whereby said gaseous products of combustion are cooled in said secondary heat exchanger to about 120° F. for condensation of at least a portion of condensible gases for substantial

recovery of latent heat of condensation of said condensible products of combustion and transfer of said heat to the dis-





charging air; and means for draining condensate from the secondary heat exchanger.

4,275,706

AIR-COOLED GRATE BAR

Balduin L. Pauli, Gauting, Fed. Rep. of Germany, assignor to Wärmetechnik Dr. Pauli GmbH & Co. Betriebs KG, Gauting, Fed. Rep. of Germany

Filed Jun. 20, 1979, Ser. No. 50,488

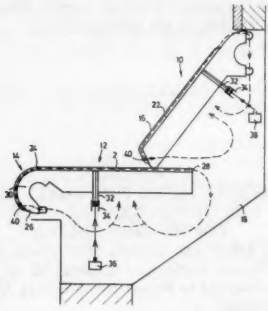
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1978, 2833255

Int. Cl.³ F23H *1/02*

U.S. Cl. 126—163 R **12 Claims**

1. An air-cooled grate bar, in particular for mechanically conveying mechanical grates such as pivot step grates, comprising

a cap which is provided over the respective grate bar so as to protect the same from wear due to excessive heat, and air passages formed by said cap with the respective grate bar, said passages extending longitudinally of the respective grate bar,



said cap having a U-shaped section with downwardly pointing legs in cross-section and a continuously interrupted transverse web supported upon the respective grate bar.

4,275,707

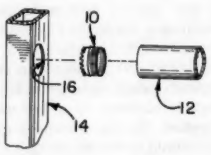
VENTILATING SYSTEM COLLAR WITH LOCK MEANS

Ronald A. Anderson, Villa Park, Ill., assignor to The Lockformer Company, Lisle, Ill.

Filed Jul. 26, 1979, Ser. No. 60,970

Int. Cl.³ F23J *13/04*

U.S. Cl. 126—318 **3 Claims**



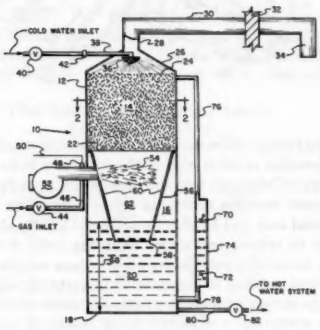
1. In a ventilating system comprising a duct for the passage of heated or cooled air, a distribution pipe attached to the duct, and a collar providing the means for securing the pipe to the duct, the improvement wherein said collar comprises locking means for securing the opposite ends of the collar together, said locking means comprising a projection extending outwardly from one end of the collar, said projection defining an outer edge extending substantially parallel with said one end, and said projection defining side edges extending angularly inwardly from said outer edge toward said one end, the other end of said collar defining a notch for receiving said projection, an inner edge defined by said notch extending substantially parallel with said other end, and side edges defined by said notch extending angularly inwardly from said inner edge toward said other end, and including collar portions extending outwardly from the respective side edges of said notch, said projection being received in said notch and extending beyond said inner edge of said notch, said collar portions extending beyond said one end on the same side of the collar as said projection, and including an intermediate tab portion defined by said inner edge, said tab portion extending beyond said one end on the side of the collar opposite said collar portions when the projection is received in the notch.

4,275,708

COMBINED HOT WATER HEATING AND STRIPPING COLUMN FURNACE AND METHOD

Harry E. Wood, 6465 Oakland Dr., New Orleans, La. 70118

Continuation-in-part of Ser. No. 938,441, Aug. 31, 1978, abandoned. This application Oct. 29, 1979, Ser. No. 88,934
Int. Cl.[3] F24H 1/10
U.S. Cl. 126—355 32 Claims



1. A hot water heater comprising:

a combination hot water heat exchanger and stripper furnace means for use in providing a non-corrosive drinking-water quality heated water, comprising:

a. an external shell structure having integrally formed therein at least two, in-line, upper and lower compartments, said lower compartment forming an open, exposed flame, heating area and said upper compartment forming a combined heat exchange and oxygen stripping area;

b. support means associated with said upper compartment;

c. a plurality of heat absorbing and transfer bodies positioned within said upper compartment and on top of said support means to a depth substantially greater than that needed for sufficient heat exchange and to a depth sufficient for substantially complete oxygen stripping from incoming water allowing for exposure flame combustion gases flowing upwardly through said upper compartment to strip substantially all the free oxygen from the water to substantially eliminate corrosive effects of CO_2 presence;

d. water supply means associated with said upper compartment for supplying water over the plurality of heat absorbing bodies, said water thereby being heated and stripped of substantially all its free oxygen, and then falling down into said lower compartment;

e. an exhaust stack positioned above said heat absorbing bodies for removing exhaust gas from said furnace means;

f. exposed flame heating means, associated with said lower compartment, operating at a relatively low temperature free of intense hot spots to avoid NO_x formations and its corrosive effects for heating said lower compartment and said upper compartment and for producing gases flowing upwardly through said upper compartment to strip the free oxygen from the water being heated; and

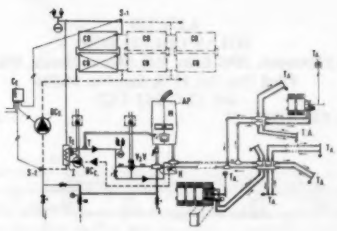
g. directing means, associated with one of said compartments, for directing the flow of water to a predetermined area in the lower compartment in order to prevent hot spots resulting in burn outs on the shell in the area of the lower compartment.

4,275,709

SYSTEM OF SOLAR HEATING BY MEANS OF FAN RADIATORS WITH FLUID CIRCUIT AND WITHOUT STORAGE

Bartolome Barcelo Rubi, Fray Luis Jaume Vallespir,1, Palma De Mallorca, Spain

Filed Mar. 15, 1979, Ser. No. 20,947
Claims priority, application Spain, Mar. 16, 1978, 467.925
Int. Cl.[3] F24J 3/02
U.S. Cl. 126—422 4 Claims



1. A solar heating system comprising first and second closed loop fluid circuit thermally connected by means of a heat exchanger;

said first fluid circuit comprising:

at least one solar collector for heating the fluid in said first circuit with the energy absorbed from solar radiation,

a first fluid pump for circulating the fluid in said first circuit,

a first temperature sensor for measuring the temperature of the first circuit fluid at the at least one solar collector and a second temperature sensor for measuring the first circuit fluid temperature at the heat exchanger,

a first control means operatively connected to said first and second temperature sensors and said first fluid pump for activating said first fluid pump when the difference between the temperature measured by said first temperature sensor and the temperature measured by said second temperature sensor exceeds a predetermined value;

said second fluid circuit comprising:

at least one radiator for transferring the heat energy contained in the fluid in said second circuit to the air adjacent said at least one radiator,

a second fluid pump for circulating the fluid in said second circuit,

a third temperature sensor operatively connected to a second control means and said second fluid pump, said third temperature sensor thermally connected to said heat exchanger, said second control means activating said second fluid pump when the temperature measured by said third temperature sensor exceeds a predetermined value,

an auxiliary fluid heater for heating said second circuit fluid,

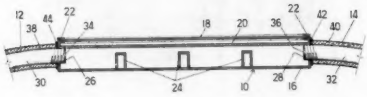
a fourth temperature sensor for sensing the second circuit fluid temperature at said heat exchanger,

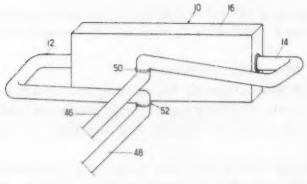
a valve means for selectively controlling the flow of the second circuit fluid path,

a third control means operatively connected to said fourth temperature sensor, valve means, and auxiliary fluid heater, wherein said third control means actuates said valve means such that the path of said second circuit fluid is diverted by said valve means so as to by-pass said auxiliary fluid heater when the temperature mea-

sured by said fourth temperature sensor exceeds a predetermined value and wherein said valve means is actuated by said third control means to enable said second circuit fluid to flow through said auxiliary heater and said auxiliary heater is controlled by said third control means to increase said second circuit fluid temperature when the temperature measured by said fourth temperature sensor is below a predetermined value.

4,275,710
SOLAR COLLECTOR
Sanford Stevenson, 3506 Bohn Rd., Mount Horeb, Wis. 53572
Filed Nov. 16, 1979, Ser. No. 94,886
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—424 **3 Claims**





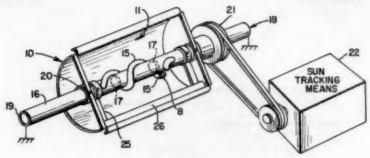
1. A solar energy collector (**10**) comprising:

a collector frame (**16**) having four sides and a back, two opposite lateral sides of the collector frame having air passage ports (**26, 28**) formed therein, each of the air passage ports formed as a threaded hole in the collector frame (**16**) with the direction of the threads of the two air passage ports (**26, 28**) being opposite;

at least one sheet of glazing (**18**) extending between the four sides of the collector frame (**16**) to cover the front thereof and to define a collector air passage between the glazing (**18**) and the back of the collector frame; and

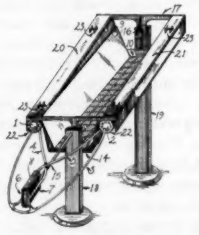
first and second fixed, well-insulated air transfer passages (**12, 14**) extending into the air passage ports (**26, 28**) in the sides of the collector frame (**16**) to open into the collector air passage, the air transfer passages (**12, 14**) being axially aligned along a horizontal axis, each of the air transfer passages (**12, 14**) including a hot air pipe (**30, 32**) having a threaded end (**34, 36**) thereon threaded into the threads in the air passage ports (**26, 28**) to pivotally connect the air transfer passages (**12, 14**) to the air passage ports (**26, 28**) such that the collector frame (**16**) may be pivoted about the horizontal axis of the air transfer passages (**12, 14**) to vary the tilt of the solar collector (**10**) without impeding air flow between the collector air passage and the air transfer passages (**12, 14**), the opposite threading of the air passage ports (**26, 28**) and the corresponding threaded ends (**34, 36**) of the hot air pipes (**30, 32**) causing the connection of the air transfer passages (**12, 14**) to the collector frame (**16**) to tighten as the collector is pivoted in the direction of tilt of winter solar collection so as to minimize heat loss and thus maximize efficiency during the winter months.

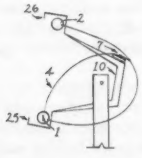
4,275,711
SOLAR ENERGY COLLECTOR SYSTEM
Robert F. Dumbeck, FM 3000, Box 548, Elgin, Tex. 78621
Filed May 16, 1979, Ser. No. 39,551
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—425 **18 Claims**



1. Solar energy collection means comprising in combination, a fixed position conduit pipe in the form of a helix longitudinally disposed along an axis and adapted for conveying liquids to be heated by solar energy in a single direction along said longitudinal axis, and a reflector arranged axially along a helical array to receive and direct upon the helix over an axial distance therealong solar energy and means adapted to move the reflector relative to the helix to concentrate solar energy on the pipe throughout the day as the sun position changes, the reflector comprises a semi-cylindrical reflection surface relatively rotatable about its axis with a fixed position circumferentially disposed cleaning member engaging the reflector surface to wipe the reflection surface when it rotates.

4,275,712
SUN TRACKING DEVICE EMPLOYING DISPLACED HEATING SURFACES FOR AUTOMATIC MORNING REORIENTATION
Stephen C. Baer, P.O. Box 712, Albuquerque, N. Mex. 87103
Filed Oct. 25, 1979, Ser. No. 88,016
Int. Cl.³ F24J *3/02*; G03B *21/00*
U.S. Cl. 126—425 **11 Claims**





1. In a solar tracking mechanism in which a solar collector is pivotably mounted to move about a generally north-south axis and includes a pair of interconnected east and west spaced canisters containing a volatile liquid which is transferred between the canisters based upon heat influx to keep the collector

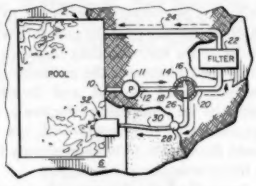
pointed toward the sun as it moves through the sky from east to west during the day, the improvement comprising a solar heat receiving means oriented at least partially toward the east horizon at all times during movement of the collector, and means for providing heat transfer from the heat receiving means to the west canister so that heat from the early morning sun raises the temperature in the west canister resulting in a mass transfer of the volatile fluid from the west canister to the east canister to pivot the collector toward the morning sun.

4,275,713

HYDROMASSAGE AIR INJECTOR APPARATUS

Linn Tellander, Box 1250, Black Canyon Stage, Phoenix, Ariz. 85029, and Billy J. Lord, P.O. Box 9995, Phoenix, Ariz. 85068

Filed Feb. 25, 1980, Ser. No. 124,127
Int. Cl.³ A61H 9/00
U.S. Cl. 128—66 **14 Claims**



1. Portable hydromassage therapy apparatus adapted for use with a pool containing a quantity of water and having a side and a deck adjacent the side and having a water circulation system, including a pump for drawing water out of the pool and returning the water to the pool, comprising, in combination:

a flexible conduit coupled to the water circulation system for receiving a flow of water from the pump;

head means connected to the flexible conduit and movable for positioning on the deck at the side of the pool, and including a portion disposed in the quantity of water in the pool, including

a first conduit connected to the flexible conduit for receiving a flow of water therefrom,

a second conduit movably connected to the first conduit and extending from the first conduit to an end disposed in the quantity of water and receiving the flow of water from the first conduit,

air pipe means adjacent the first and second conduits for providing a flow of air,

an air conduit connected to the air pipe means and extending within the second conduit and terminating at an end within the second conduit a predetermined distance from the end of the second conduit for receiving the flow of air from the air pipe means, and

collar means disposed on the air conduit for disturbing and accelerating the flow of water within the second conduit and about the air conduit, the flow of water within the second conduit and about the air conduit and the collar providing a flow of water and air from the end of the second conduit.

4,275,714

SPINAL POSITIONING COUCH

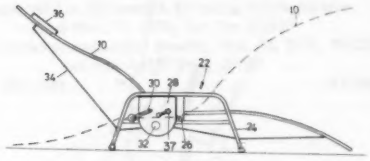
Sidney E. Lewis, 89 Cherry Dr., Northcliff View, Johannesburg, Transvaal, South Africa

Filed Jun. 18, 1979, Ser. No. 49,652
Claims priority, application South Africa, Jun. 23, 1978, 78/3606
Int. Cl.³ A61F 5/00; A47C 1/12
U.S. Cl. 128—74 **5 Claims**

1. In a spinal positioning couch including a body support portion having head, back, seat and leg support zones and a support frame on which the body support portion of the couch is mounted for movement about a horizontal pivot connection between the body support portion and the frame; the improvement in which

(a) the leg support zone from approximately the center of the seat support zone is inclined at a fixed mean angle of between 130° and 170° relatively to the back and head support zones;

(b) the back support zone includes an outwardly convex



substantially non-deformable hump adapted to move the thoracic vertebrae T11, T12 and L1 of an adult user forwardly relatively to the remainder of his spinal column when the user lies on the couch in a supine position,

(c) a head rest on the head support zone, and

(d) means for moving the body support portion of the couch about its pivot connection with the frame between a substantially horizontal position and a position in which the head support zone is vertically lower than the seat support zone.

4,275,715

EAR RACK FOR SUPPORTING DOG EARS ERECT

Randall R. Wolfe, Rte. 5, Box 99 W, Jasper, Ala. 35501

Filed Dec. 26, 1979, Ser. No. 106,516
Int. Cl.³ A61F 5/08
U.S. Cl. 128—76 R **7 Claims**

1. An ear rack for supporting the ears of a dog erect comprising,

(a) a generally round base member as viewed in plan of a width to span substantially the distance between the ears of a dog and having an upstanding flange extending around the periphery thereof,

(b) an upstanding support member formed integrally with said upstanding flange at each side of said base member in position for the outer surface thereof to lie alongside the inner surface of a dog ear adjacent thereto, and

(c) means to secure each said upstanding support member to the dog ear adjacent thereto so that each dog ear is thereby supported in an erect position.

4,275,716

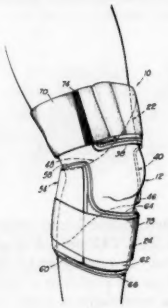
KNEE BRACE

Linzy Scott, Jr., 2085 Campbellton Rd., Atlanta, Ga. 30311

Filed Sep. 24, 1979, Ser. No. 78,186
Int. Cl.³ A61F 3/00
U.S. Cl. 128—80 C **26 Claims**

1. An orthopedic appliance for the joint on a limb comprising: a first band which is adapted to traverse the anterior

portion of said limb above said joint and which has opposed ends, a first rigid means that is joined at one of said ends of said first band and which extends downwardly so as to span a first side of said joint when said first band is on said anterior portion of said limb, a second band which is adapted to traverse the anterior portion of said limb below said joint and which has opposed ends, a second rigid means which is joined to one of said ends of said second band and which projects upwardly so



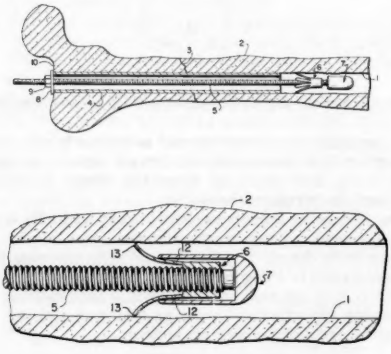
as to span a second side of said joint when said second band is on said anterior portion of said limb, said first and second sides of said joint being in opposed relationship and a section being of sufficient length to cross the posterior portion of said joint and to interconnect said first and said second rigid means, said appliance capable of embracing said limb in a spiral-shaped configuration and having a longitudinal axis, said first and second rigid means being oriented on said appliance such that they are in spaced, staggered relationship along said axis.

4,275,717

INTRAMEDULLARY FIXATION DEVICE FOR FRACTURED TUBULAR BONES

Richard C. Bolesky, Warsaw, Ind., assignor to Zimmer USA, Inc., Warsaw, Ind.

Filed Jul. 27, 1979, Ser. No. 61,343
Int. Cl.³ A61F 5/04
U.S. Cl. 128—92 BC **6 Claims**



1. In an internal fixation device for fractured tubular bones, the combination of:

(a) a rod having a leading end portion and a trailing end portion,

the length of the rod being such that the rod can be inserted through a bored entrance, leading-end-first, into the medullary canal of the fractured bone so as to position the leading end portion beyond the fracture when the trailing end portion is adjacent the entrance of the canal,

at least the leading end portion of the rod being threaded;

(b) a hollow, generally cup-shaped nose member secured to the leading end portion of the rod and comprising a wall surrounding the leading end portion of the rod to define a cavity opening toward the trailing end of the rod;

(c) a gripper unit comprising

an internally threaded hub having its threads operatively engaged with the threads of the leading end portion of the rod, and

a plurality of outwardly concave, springy, resilient gripper fingers evenly spaced about and extending both outward from the periphery of said hub and generally toward the trailing end of the rod, said fingers having pointed free ends adapted for penetrating engagement with the osseous tissue surrounding the medullary canal; and

(d) adjustable means operatively connected to the trailing end portion of the rod adapted for coacting with the bone to apply to the rod a force tending to move the leading end portion of the rod toward the entrance of the canal;

whereby, this movement of the rod, and therefor the hub, toward the entrance of the canal being effective to increase the penetrating engagement of the fingers with the wall of the canal, and to cause the fingers to be increasingly bowed, thus maintaining the fracture in compression; and

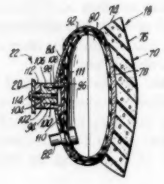
whereby, upon healing of the fracture, the device may be withdrawn when the adjustable means is adjusted to release said force, subsequent rotation of the rod in one direction while the gripper fingers are engaged with the osseous tissue of the canal and holding the hub against rotation which causes longitudinal movement of the nose member, which member acts as a gripper unit collapsing member, toward the gripper unit until the nose member engages the gripper unit and collapses the fingers to the extent at which said pointed ends are no longer engaged with and exerting pressure on, the osseous tissue of the canal, thereby allowing withdrawal of the fixation device from the canal.

4,275,718

PELVIC DEVICE

Martin Jungmann, deceased, late of Rangeley, Me. (by Gertrude Jungmann, heir), assignor to Institute for Gravitational Strain Pathology, Inc., New York, N.Y.

Filed Aug. 2, 1979, Ser. No. 63,048
Int. Cl.³ A61F 5/24
U.S. Cl. 128—95 **11 Claims**



1. In a pelvic device having a pair of pad members respectively adapted to be located in opposed relationship to a pubic bone and a lower sacrum of a wearer's body, a pair of curved spring members for encircling the body, a pair of connecting bars respectively interconnecting lateral ends of said curved members, latch means for detachably connecting one end of one of said connecting bars to an associated one of said lateral ends of one of said curved members on one side of said device, and coupling means rotatably connecting each of said pad members to an associated one of said connecting bars respectively, an improvement comprising:

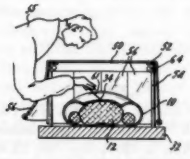
each pad member including inflating means for individual inflation thereof to regulate its respective outer contour;
each of said pad members including an inflatable bladder;
a resilient pad being mounted onto one side of each of said bladders, and an associated supporting member being coupled to an opposite side of each of said bladders;
each of said coupling means being connected to its said associated supporting member;
each of said coupling means extending through a central opening provided in its said associated supporting member; and
each of said inflating means including a filling valve extending from said bladder through an offset opening provided in its said associated supporting member for access thereto.

4,275,719

APPARATUS AND METHOD FOR PROVIDING AN ASEPTIC SURGICAL ENVIRONMENT

Nathan Mayer, 27 Messler St., East Brunswick, N.J. 08816

Filed Mar. 30, 1979, Ser. No. 25,333
Int. Cl.³ A61F *13/00*; A61B *19/00*
U.S. Cl. 128—132 D **10 Claims**



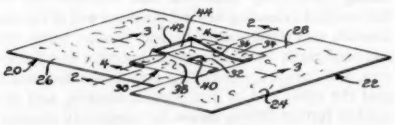
1. A method of providing an aseptic environment over an incision site on a patient's body comprising the steps of completely enveloping at least the portion of the patient's body which includes said incision site with a flexible plastic film layer, adhesively attaching and thereby sealing said film layer to said patient's body remote from said incision site and adhesively attaching and thereby sealing said film layer to said patient's body proximally surrounding said incision site so as to form a region between the remote and proximal seals, the film layer, and the patient's body remote from said incision site, providing a circulating first sterile atmosphere within said region, enveloping said region and said incision site with a flexible plastic layer which isolates said region and said incision site so as to form a volume therebetween, and conditioning and providing a second circulating sterile atmosphere within said volume.

4,275,720

SURGICAL DRAPE WITH BARRIER MEMBER

Cynthia A. Wichman, St. Charles, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Aug. 8, 1979, Ser. No. 64,975
Int. Cl.³ A61F *13/00*
U.S. Cl. 128—132 D **20 Claims**



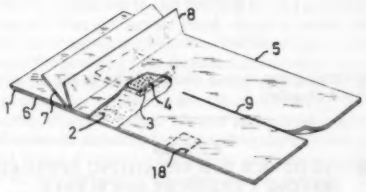
1. A surgical drape, comprising: a sheet of flexible material for covering a portion of a patient's body, a fenestration, first and second flaps on opposed sides of the fenestration and defining openings facing toward the fenestration, and a third flap spaced from the fenestration and integrally connecting the first and second flaps such that it acts as one piece, said third flap defining an opening facing toward the fenestration.

4,275,721

VEIN CATHETER BANDAGE

Karin S. B. Olson, Lund, Sweden, assignor to Landstingens Inkopscentral Lic, Ekonomisk Forening, Solna, Sweden

Filed Nov. 21, 1979, Ser. No. 96,553
Claims priority, application Sweden, Nov. 28, 1978, 7812240
Int. Cl.³ A61M *5/00, 25/02*
U.S. Cl. 128—133 **4 Claims**



1. Vein catheter bandage, characterized by an oblong, preferably air-permeable and liquid-tight protective sheet which has a sticky layer on one side and on top of that a liquid-absorbing layer which is substantially smaller than half of the protective sheet and is located in its entirety within one half of the protective sheet when said sheet is divided transversely, and at a distance from the edges of the protective sheet, preferably a non-absorbent, liquid-permeable sheet which covers the absorbent layer, the absorbent layer or in certain cases the non-absorbent sheet being intended, when the bandage is used, to lie against the incision of the vein catheter, and on top of said layers or on top of said layers and said sheet two covering pull sheets which together cover the entire surface of the protective sheet and extend from each end of the protective sheet, meeting above the absorbing layer of the non-absorbent sheet where their end portions form two gripping tabs, one folded back on itself and the other lying on top of the first, a slit being arranged through the protective sheet, the sticky layer and the pull sheet from the end of the bandage which is farthest from the absorbent layer and extending to a short distance from the absorbent layer.

4,275,722

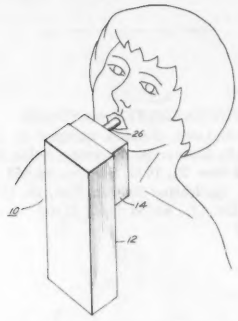
RESPIRATORY EXERCISER AND REBREATHING DEVICE

Harry D. Sorensen, 740 Conrad Rd., Niles, Mich. 49120

Filed May 4, 1979, Ser. No. 36,093
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—200.24 **16 Claims**

1. A respiration exerciser and rebreathing device comprising walls forming first and second chambers, connection means therebetween for the passage of air, a mouthpiece for breathing into and out of said device, valve means including first and second passages connected to said first and second chambers, respectively, for regulating air flow between said mouthpiece and said first and second chambers so as to permit the passage of exhaled air from said mouthpiece into said first chamber and to supply inhaled air from said second chamber to said mouthpiece, and air flow means for connecting said first chamber to

ambient air and for mixing outside air with exhaled air flowing through said first chamber and through said connection means



thereby varying the carbon dioxide level in the air entering said second chamber.

4,275,723

WARNING DEVICE FOR BREATHING APPARATUS HAVING A PRESSURE GAS SUPPLY

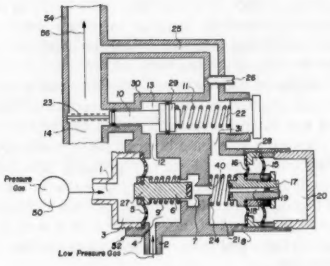
Ernst Warncke, Lübeck, and Adalbert Pasternack, Bad Schwartau, both of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 22, 1979, Ser. No. 68,668

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1978, 2838366

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—202.22 **4 Claims**



1. A warning device for a protective breathing gas apparatus of the type having a high pressure gas supply and a pressure reducer connected to the high pressure gas supply for providing a low pressure gas supply comprising a conduit defining a respiratory gas flowpath,

a housing having a first chamber, first diaphragm valve means mounted in said first chamber and dividing said first chamber into a high pressure space connected to the high pressure gas supply and a low pressure space connected to the low pressure gas supply, said first diaphragm valve means being movable responsive to the differential pressure between said pressure spaces, a second chamber, second diphragm valve means movably mounted in said second chamber dividing said second chamber into a vestibule space and a rear space and including a bore connecting said vestibule space and said rear space, wall means defining an orifice for connecting said low pressure space and said vestibule space and including a first valve seat adjacent said low pressure space for sealingly receiving said first diaphragm valve means and a second valve seat adjacent said vestibule space for sealingly receiving said second diaphragm valve means, a third chamber having a piston compartment in fluid communication with the gas flowpath, a piston slidably mounted in said piston compartment and dividing said piston compartment into a first piston space communicating with said flowpath and a second space, said piston having a signal portion movable with said piston between a first portion into the flowpath and a second position out of the flowpath, said signal portion being responsive to fluid flow in said flowpath for actuating a warning signal, a first passage connecting said low pressure space and said first piston space, a second passage connecting said vestibule space and said second piston space, a third passage connecting said second piston space and said flowpath, means for throttling said third passage, said first diaphragm valve means being operative to sealingly engage said first valve seat when the differential pressure is above a predetermined level and to sealingly disengage from said first valve seat when the differential pressure is below the predetermined level,

said second valve means being operative to sealingly engage said second valve seat when the pressure in said vestibule space and said rear space is equal,

and said piston being operative to move the signal portion into the flowpath when said first diaphragm valve means and said second diaphragm valve means are respectively disengaged from said first valve seat and said second valve seat.

4,275,724

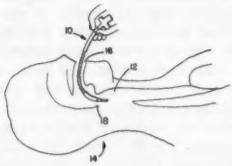
ENDOTRACHEAL INTUBATION DEVICE

Barry Behrstock, 275 Victoria St., Costa Mesa, Calif. 92627

Filed Apr. 2, 1979, Ser. No. 25,905

Int. Cl.³ A61M *25/00*

U.S. Cl. 128—207.14 **5 Claims**



1. An endotracheal intubation device which enables the user to simultaneously apply suction during the intubation process to remove meconium and other accumulated body fluids, comprising:

a first inner elongated, flexible conduit of a greater length than a second elongated conduit and extending throughout having a smooth, tapered insertion end configured for insertion into the upper airways of a newborn baby and a proximal end configured for joining to a source of suction; and

a second outer elongated conduit circumferentially disposed about said first conduit along the length thereof and in sliding relationship therewith, said insertion end of the first conduit extending beyond the distal end of the second conduit, said distal end of second conduit being smooth and configured for nontraumatic insertion into the mouth area, and outwardly extending grip means disposed adjacent the other end of said second conduit, said second conduit further having means for selectively shaping and retaining said second conduit substantially along its entire length into any one of an infinite different configurations, but generally of an arcuate configuration whereby shaping said second outer conduit into a selected configuration causes said first, inner conduit to be shaped and retained in a substantially congruent configuration.

4,275,725
BREATHING APPARATUS

Byron G. Nelson, P.O. Box 6457, Lake Charles, La. 70606

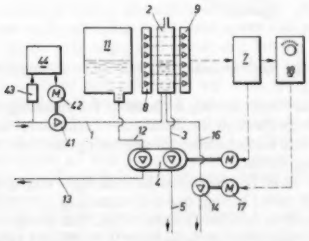
Filed Dec. 3, 1979, Ser. No. 99,855
Int. Cl.³ A61M 15/00
U.S. Cl. 128—207.14 10 Claims

1. In a breathing apparatus of the kind which is fittable in the mouth of a human between the cheek and teeth, which apparatus includes tube means having an opening proximate to the lips and an opening distal to the lips, said distal opening adapted to be located proximate the molars, said openings being sized in combination to permit a flow of respirated air through said tube means approximate the flow of air said human could achieve through normal nasal breathing; said tube means being adapted and having sufficient length to extend from the front of said mouth back down the side of said mouth to a point adjacent the molars, and sealing means adapted to extend from said front open end around the front of said mouth to an extent to seal off passage of air through said front of said mouth except into said front opening, said sealing means being adapted for fitment between the frontal teeth and lips; an improvement comprising flange stabilizer means coupled to an extension of said tube means at a point forward of said sealing means, said flange stabilizer means being adapted for fitment along the exterior of said lips when said apparatus is in the mouth, said flange stabilizer means being in a plane approximately parallel to the plane of said sealing means, the space between said flange stabilizer means and said sealing means being approximate the width of said human's lips.

4,275,726
APPARATUS FOR FLUID BALANCING UNDER STERILE CONDITIONS

Wilfried Schael, Bad Homburg, Fed. Rep. of Germany, assignor to Dr. Eduard Fresenius, Chemisch-pharmazeutische Industrie KG Apparatebau KG, Bad Homburg, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 966,497
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1977, 2754894
Int. Cl.² A61J 7/00
U.S. Cl. 128—213 A 10 Claims

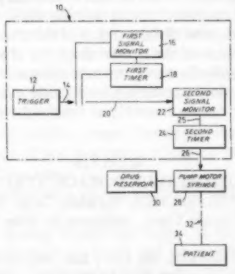


1. An apparatus for balancing the fluids withdrawn from a patient and the fluids simultaneously returned into the patient, comprising first pump means having a pump inlet and a pump outlet, measuring chamber means (2) for measuring a quantity of fluid withdrawn from the patient by said pump means, first conduit means (1) operatively connecting an inlet of said measuring chamber means (2) to a patient for withdrawing fluid from the patient into the measuring chamber means, second conduit means (3) operatively connecting an outlet of said measuring chamber means to said pump inlet for withdrawing fluid from the measuring chamber means, third conduit means (5) connected to said pump outlet to discharge fluid, supply container means (11), second pump means also having respective pump inlet means and respective pump outlet means, fourth conduit means (12) operatively connecting said supply container means (11) to said pump inlet means of said second pump means and fifth conduit means (13) operatively connecting said pump outlet means of said second pump means to a patient for returning fluid into a patient, first motor means (6) operatively connected to said first and second pump means for driving said first and second pump means in unison, said conduit means comprising respective conduit sections operatively arranged for pumping fluid therethrough in unison by said first and second pump means, and control means (7, 8, 9) operatively responsive to the rise and fall of the filling level in said measuring chamber means (2) and operatively connected to said first motor means (6) for controlling the speed of operation of said first and second pump means in response to the filling level in said measuring chamber means, whereby the fluid withdrawal and fluid return take place simultaneously while the withdrawal rate and the return rate are continuously balanced relative to each other during treatment so that withdrawing excessive liquid quantities from the patient is prevented.

4,275,727
DEVICE FOR MONITORING AND CONTROLLING SELF-ADMINISTERED INTRAVENOUS DRUG DOSAGE

Michael Keeri-Szanto, 10 Beechwood Place, Apt. 612, London, Ont. N6C 1H7, Canada

Filed Jun. 7, 1980, Ser. No. 109,928
Int. Cl.³ A61M 5/00
U.S. Cl. 128—214 E 2 Claims



1. A device for monitoring and controlling the operation of a motorized syringe to dispense a predetermined drug dosage comprising;

(a) trigger means operable by a patient to initiate a demand signal indicative of a demand for an individual drug dose,

(b) first signal monitor means adapted to record the total number of occasions on which said demand signal is initiated by operation of said trigger means,

(c) first timer means for receiving said demand signal and selectively rejecting said demand signal or emitting said demand signal as an inject signal,

(d) second signal monitor means adapted to record the total number of occasions on which said first timer means emits a demand signal,

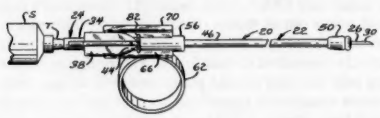
(e) second timer means for receiving said inject signal, said second timer means being operable on receipt of said inject signal to activate said motorized syringe for a preselected timer period to dispense a predetermined individual dose of drug.

4,275,728

ANESTHESIA DEVICE

Jack D. Merry, Summerville, S.C., assignor to The Kendall Company, Boston, Mass.

Filed Feb. 25, 1980, Ser. No. 124,188
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—215 **8 Claims**



1. A device for performing an anesthesia procedure on a patient, comprising:

a needle assembly having an elongated hollow needle with a distal tip, and a connecting member attached to a proximal end of the needle, with said connecting member having a elongated distally directed control member generally aligned with and spaced from the needle; and

a sleeve assembly having an elongated hollow sleeve to slidably receive the needle, and an abutment member attached to a proximal end of the sleeve, said abutment member having a first proximal stop member to abut against a distal portion of the control member in a configuration of the needle assembly at a first rotational position with the needle tip retracted within the sleeve assembly, and guide means to releasably retain the needle assembly at the first rotational position, said abutment member having a second intermediate stop member to abut against the distal portion of the control member in a configuration of the needle assembly at a second rotational position with the needle tip extending an intermediate distance from the sleeve assembly, and guide means to releasably retain the needle assembly at the second rotational position, and said abutment member having a third distal stop member to abut against the distal portion of the control member in a configuration of the needle assembly at a third rotational position with the needle tip extending a maximum distance from the sleeve assembly, and guide means to releasably retain the needle assembly at the third rotational position.

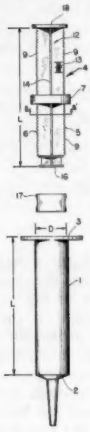
4,275,729

ADJUSTABLE DOSAGE SYRINGE

Jules Silver, P.O. Box 1188, Norwich, Conn. 06360, and James F. Ennis, Preston, Conn., assignors to Jules Silver, Norwich, Conn.

Filed Oct. 29, 1979, Ser. No. 88,936
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—218 C **10 Claims**

1. In an adjustable dosage syringe having a syringe barrel with an internal length and diameter which forms a volume sufficient to contain multiple dosages of a liquid, a discharge end at one end of the barrel length, a plunger receiving end at the opposite end of the barrel length, and a plunger slidably disposed within the barrel and having a length greater than the length of the barrel, the improvement comprising a plunger having at least first and second sets of multiple closely spaced indentations disposed along the length thereof, a dosage selection ring disposed around the plunger and rotatable about the longitudinal axis thereof, at least one pair of protuberances each of which is of a configuration suitable for being in register with and received in one indentation of the respective first and second sets of indentations and said protuberances being disposed on the inside circumference of said ring so that when one of the protuberances is received in the first set of indentations, the other protuberance is received in the second set of indentations, at least two channels disposed along the length of the plunger for simultaneously slidably receiving, respectively, the said protuberances so that the said ring is longitudinally slidable along the length of the plunger,



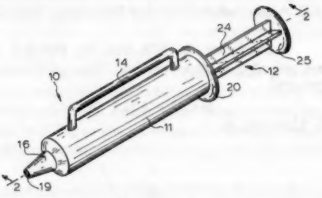
whereby any desired dosage may be set by rotating the ring so that the protuberances are received in said channels, sliding the ring along the length of the plunger to that part thereof corresponding to the desired dosage, rotating the ring so that the protuberances are received by the indentations and sliding the plunger into the barrel until the ring is engaged by the said plunger receiving end of the barrel and the desired dosage of liquid is expelled out of the discharge end of the barrel.

4,275,730

SYRINGE WITH PRESSURE-LIMITED DELIVERY

Hany M. Hussein, Clifton, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed Nov. 5, 1979, Ser. No. 91,323
Int. Cl.³ A61M *1/00*
U.S. Cl. 128—234 **6 Claims**



1. A syringe with pressure-limited delivery capacity comprising:

an elongate barrel having a chamber for retaining fluid;

a passageway through the distal end of said barrel communicating with said chamber for delivering said fluid to a fluid receiving device;

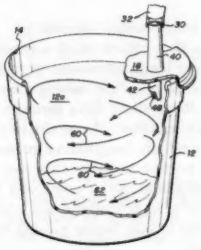
a plunger slidably positioned in fluid-tight engagement inside said barrel having one end extending outwardly from said barrel to facilitate its operation, said plunger adapted to force fluid from said chamber through said passageway upon its movement toward said distal end; and

a length of hollow by-pass tubing connected to said barrel near its distal end, the hollow lumen of said tubing com-

municating with said chamber in a permanently open valveless condition, the opposite end of said tubing adapted to vent to atmospheric pressure level conditions, the diameter and the length of said tubing selected so as to pre-determine the pressure level inside said chamber required for fluid to flow out of the opposite end of said tubing upon distal movement of said plunger, said pressure level thereby being the maximum pressure level which said syringe is capable of delivering to said fluid receiving device.

4,275,731
SUCTION CANISTER WITH VORTEX FLOW DEFLECTOR

Robert L. Nichols, 800 Fort Worth St., Jacksonville, Tex. 75766
Filed Jul. 10, 1978, Ser. No. 923,391
Int. Cl.[3] A61M 1/00
U.S. Cl. 128—276 1 Claim



1. A suction system for receiving and retaining fluids drained from a source comprising:

a canister with a vertical central axis having a closed bottom, substantially cylindrical sidewalls and an open top;

a detachable circular cover adapted to selectively close said open top having an interior surface and an exterior surface and means for forming a vacuum-tight seal between said canister and said cover;

said cover including a vacuum port for connection to a vacuum source to apply vacuum to the interior of said canister;

said cover further including a deflector having an inlet port for admitting fluid into the interior of said canister and having an upper and lower end, said deflector being a tubular body having a vertical axis disposed in a parallel spaced-apart relationship with the canister central axis such that said deflector is positioned near the perimeter of said cover;

said cover, vacuum port and deflector being one contiguous piece of material;

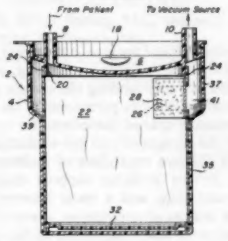
said upper end of said deflector disposed above said exterior surface of said cover and slightly tapered from said exterior surface of said cover to receive an inlet tube;

said lower end of said deflector disposed below the interior surface of said cover and being partially closed by a bottom wall extending across said lower end and ending at a bottom wall edge, said lower end having two sidewalls and a top wall forming with said bottom wall edge a rectangular aperture, said top wall being a horizontal surface, said bottom wall having an interior surface inclined slightly downward, said sidewalls being inclined with respect to said axis of said deflector such that the midpoint of said topwall is at a greater radial distance from said axis than the midpoint of said bottom wall edge; and

said rectangular aperture positioned in said deflector such that a stream of fluid exiting said aperture impinges on said sidewalls of said canister at an incident angle sufficiently small to reduce the velocity impact of the stream of fluid and create a unidirectional circumferential helical flow of said stream of fluid around the sidewalls of said canister, wherein the velocity of the fluid exiting said deflector is sufficiently retarded to effectively prevent the formation of aerosal droplet formation and entry of admitted fluid into said vacuum port.

4,275,732
SUCTION CANISTER WITH MEMBRANE SHUT-OFF VALVE

Gordon A. Gereg, P.O. Box 357, Center Valley,, Pa. 18034
Continuation-in-part of Ser. No. 826,273, Aug. 19, 1977. This application Mar. 24, 1980, Ser. No. 133,242
Int. Cl.[3] A61M 1/00
U.S. Cl. 128—276 1 Claim



1. A canister for use in aspirating body liquids, comprising

a circular cylindrical vessel substantially closed to the atmosphere with top and bottom closures,

a flexible plastic bag of fluid-impermeable material having upper and lower side wall portions which are normally circularly cylindrical when the bag is fully distended

means for suspending said bag from the top closure within said vessel with the axis of the bag vertically disposed,

a generally rectangular aperture through the upper side wall portion of the bag adjacent to top thereof, said aperture being substantially longer in the circumferential direction of the bag side wall than in the axial direction thereof and being bounded at its top and bottom by edges which extend in the circumferential direction of the bag,

a first fluid coupling means for connecting the interior of said bag to a liquid withdrawal conduit extending exteriorly of the cannister,

a second fluid coupling means for connecting space between the exterior of said bag and the interior of said vessel to a source of vacuum,

a liquid impermeable, gas permeable membrane across said aperture,

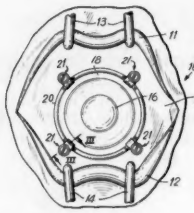
said vessel having lower and upper cylindrical side wall portions of relatively lesser and greater diameters respectively connected by a transitional portion which extends outwardly and upwardly from the top of the lower side wall portion of the vessel to the bottom of the upper side wall portion of the vessel, the upper side wall portion of the vessel being disposed laterally outward from the upper side wall portion of the bag,

the relative sizes of the side wall portions of the vessel and bag being such that when the bag is fully distended the lower side wall portion of the vessel closely and supports the lower side wall portion of the bag, and the upper side wall portion of the vessel is spaced outwardly from the upper side wall portion of the bag, whereby the vessel provides support of the lower side wall portion of the bag against outward distortion and the upper portion of the vessel provides clearance outwardly of the membrane so as to avoid masking thereof as the bag fills.

4,275,733
OPHTHALMOLOGICAL SURGICAL INSTRUMENT

Gerald P. Marinoff, 8 Rockford Dr., West Nyack, N.Y. 10999

Filed Oct. 22, 1979, Ser. No. 86,816
Int. Cl.[3] A61B 17/00
U.S. Cl. 128—303 R 7 Claims

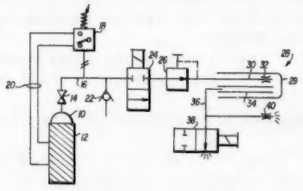


1. An ophthalmological surgical instrument for stabilizing an eye during ophthalmic surgery comprising, a ring adapted to be placed on the eye surrounding the cornea of the eye, and a plurality of securing devices permanently carried by said ring and circumferentially spaced thereabout for temporarily securing said ring to the surface of said eye so that said ring supports the integrity of the eye regardless of incisions made therein, each securing device includes support means permanently connected to said ring, and a twist fixator carried by said support means for axial movement therethrough to effect temporary fixation of said ring to the surface of the eye, said support means comprising an internally threaded cylinder pivotally connected to said ring, said twist fixator having external threads and thus carried by said threaded cylinder for axial movement therethrough upon rotational movement of said fixator, said external threads of said fixator being non-slip threads to prevent undesired rotational movement of said fixator in said cylinder.

4,275,734
CRYOSURGICAL APPARATUS AND METHOD

Robert K. Mitchiner, Longmont, Colo., assignor to Valleylab, Inc., Boulder, Colo.

Filed Aug. 12, 1977, Ser. No. 824,174
Int. Cl.[3] A61B 17/36
U.S. Cl. 128—303.1 56 Claims



1. Cryosurgical apparatus comprising a coolant supply where a coolant selected from the groups consisting of nitrous oxide, carbon dioxide, Freon 13 or Freon 23 is disposed within a container as a liquid due to the pressure of its own vapor where the critical temperature of said coolant is greater than room temperature;

pressure maintaining means for maintaining said pressure of the vapor at approximately at least what it is at room temperature;

a cryosurgical instrument having a coolant expansion means disposed at the distal end of a feed passageway; and

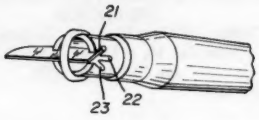
means for supplying said coolant to the feed passageway of said cryosurgical instrument so that the temperature of the coolant discharged through said expansion means is lowered;

whereby said pressure maintaining means maintains said vapor pressure at approximately at least what it is at room temperature during said supplying of the coolant to the feed passageway of the cryosurgical instrument.

4,275,735
SURGICAL BLADE HOLDER

Reinald J. Chutter, 1260 Southfield Pl., Virginia Beach, Va. 23452

Filed May 21, 1979, Ser. No. 40,912
Int. Cl.[3] A61B 17/32
U.S. Cl. 128—305 1 Claim



1. A surgical blade holder comprising

(a) a handle with a hollow head portion at an obtuse angle relative to the longitudinal axis of said handle;

(b) said hollow head portion having a first slot which is long relative to three short slots through the forward most section of the wall thereof; one slot of said three short slots having substantially longitudinal orientation with respect to the head portion and the other two slots on either side of said longitudinal slot at essentially 45 degrees relative thereto to form an arrowhead slot configuration;

(c) a shank fixed in said handle passing through said hollow head portion;

(d) a blade-retaining ring attached to the anterior portion of said shank;

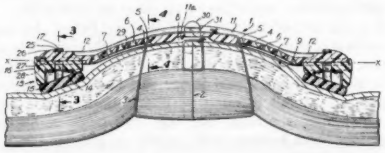
(e) said blade-retaining ring having a slot in the anterior portion thereof for engaging a surgical blade in combination with said three short slots in said head; and

(f) means associated with said shank to cause relative motion between said hollow head portion and said shank to move said blade-retaining ring into said first slot in said hollow portion to thereby engage and hold a replaceable surgical blade placed in one of said three short slots for surgery in areas of limited surgical access.

4,275,736
RETENTION SUTURE BRIDGE

Ingram S. Chodorow, Upper Saddle River, N.J., and J. David Dainow, New York, N.Y., assignors to Technalytics, Inc., Upper Saddle River, N.J.

Filed Jan. 2, 1979, Ser. No. 263
Int. Cl.[3] A61B 17/04
U.S. Cl. 128—335 18 Claims



1. A bridge device for use with a retention suture looped about the juxtaposed layers of a wound or incision to be closed, the suture thus being partially below the surface of the juxtaposed layers with two exposed end parts of the suture extending out of and above a pair of exit points in the outer layer of skin, these exit points being located on both sides of the incision and defining between them a line generally perpendicular to the incision, the bridge device comprising:

(a) an arch having a central part and opposite end parts, the

central part having top and bottom surfaces and length defined between said end parts,

(b) a plurality of suture-engaging means spaced apart along said central part in the lengthwise direction,

(c) first and second foot parts, and

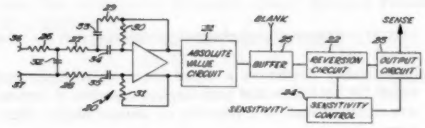
(d) pivot means pivotally coupling each of said first and second foot parts to one of said end parts, each pivot means permitting pivotal movement of one foot independent of the other foot about an axis extending in the lengthwise direction relative to said central part.

4,275,737

DEMAND CARDIAC PACEMAKER HAVING REDUCED POLARITY DISPARITY

David L. Thompson, Fridley, Minn., and Marc T. Stein, Tempe, Ariz., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 6, 1978, Ser. No. 957,813
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 PG **3 Claims**



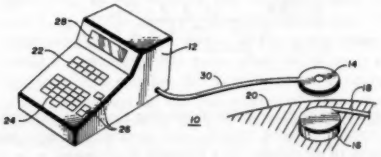
1. In a cardiac pacemaker of the type having means for sensing heart activity, means responsive to the sensing means for detecting the occurrence of natural heart activity and means responsive to the detecting means for affecting the operation of said pacemaker, the improvement wherein said detecting means comprises amplifier means having an essentially polarity independent degree of response to said sensing means and including differential input means and dual output means, each of said output means being connected within said detecting means with the signals appearing at the said output means being of opposite polarity to each other and having an absolute value representative of signals appearing at said input means.

4,275,738

DIGITAL CARDIAC PACEMAKER CLOCKING MEANS

Ray S. McDonald, St. Paul, and Martin A. Rossing, Anoka, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 6, 1978, Ser. No. 958,322
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 PG **14 Claims**



1. A digitally controlled cardiac pacemaker pulse generator powered by an electrical power source for providing cardiac stimulating pulses at a defined rate and at a defined pulse width, said pulse generator comprising:

clock means for providing a series of clock pulses;

a resettable first counter for counting clock pulses applied thereto;

means for coupling said series of clock pulses to said first counter;

a second counter for counting pulses applied thereto;

counter interface means responsive to said first counter for providing a counting pulse to said second counter each time said first counter reaches a first count and for resetting said first counter;

rate decoding means responsive to the count of said second counter reaching a defined value for providing a signal manifesting that a cardiac stimulating pulse is to be provided;

pulse width decoding means responsive to said rate decoding means signal and the count of said first counter reaching a defined value for providing a signal manifesting the desired pulse width of said cardiac stimulating pulse; and

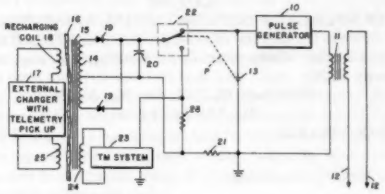
output means responsive to said rate decoding means signal and said pulse width decoding means signal for providing said cardiac stimulating pulse.

4,275,739

CHARGE CONTROL SWITCH RESPONSIVE TO CELL CASING DEFLECTION

Robert E. Fischell, Silver Spring, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Jan. 26, 1979, Ser. No. 6,723
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 PS **7 Claims**



1. In combination with a rechargeable battery of the type employed for supplying operating energy to implantable biomedical electronic apparatus, said rechargeable battery being enclosed in a hermetically sealed casing fabricated of electrically conductive material and being operably connected to receive while implanted recharging current from recharging circuitry, said rechargeable battery further being of the type which produces an increased gaseous pressure within said casing when said battery in its fully charged condition,

a switch structure for sensing state of charge of said rechargeable battery, said switch structure comprising:

an integral wall portion of said electrically conductive battery casing which deflects outwardly in response to said increased gaseous pressure,

an insulative support means secured to said electrically conductive battery casing adjacent said deflecting integral wall portion thereof, and

an electrically conductive contact means carried on said support member insulated electrically and spaced by a predetermined distance from said electrically conductive battery casing adjacent said deflecting wall portion,

said predetermined distance being selected so that said electrically conductive casing comes into electrical contact with said contact means upon outward deflection of the wall portion when said battery is returned to a fully charged state during recharging operation.

4,275,740

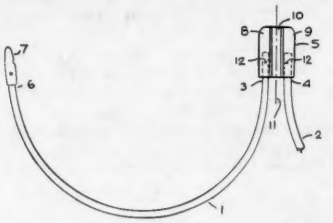
BRASSIERE FRAME

Jerome L. Weston, New York, N.Y., assignor to S & S Industries, Inc., New York, N.Y.

Filed May 22, 1979, Ser. No. 41,370
Int. Cl.³ A41C 3/06
U.S. Cl. 128—469 **2 Claims**

1. A brassiere frame to which fabric breast cups are secured comprising two arcuate wire members attached to a central integral hinged plastic member, said plastic member comprising outer holding portions which completely surround and

rigidly affix one of the ends of each arcuate wire member, and, interconnecting said holding portions and integral therewith, a hinge portion having a single central pivot axis substantially



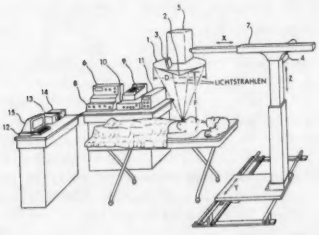
intermediate said wire ends affixed in said holding portions, whereby hinging movement of said entire brassiere frame occurs permitting said wire members to be substantially superimposed one upon the other.

4,275,741

PROCEDURE FOR NONCONTACTING MEASUREMENT OF SUBCUTANEOUS TEMPERATURE DISTRIBUTIONS

Jochen Edrich, Waldpromenade 83, Gauting, Fed. Rep. of Germany (8035)

Filed Aug. 13, 1979, Ser. No. 66,076
Int. Cl.³ A61B *6/00*
U.S. Cl. 128—653 **3 Claims**



1. An improved method for noncontacting measurement of subcutaneous body temperature distributions, said method detecting the emitted thermal electromagnetic radiation in the microwave region from subcutaneous points having a diameter of substantially one-third wavelength focussed along predetermined scan lines, said improved method comprising the steps of:

detecting said radiation in the frequency range of 8 to 36 GHz,

focussing said detected radiation with an elliptical receiving reflector having an aperture diameter of between 50 to 100 cm and having a focal length of 0.6 to 1.2 times the aperture diameter.

4,275,742

PROCESS AND DEVICE FOR PROCESSING AND DISPLAYING A READ-OUT SIGNAL FROM AN ELECTROCARDIOGRAM RECORDING READ AT A SPEED GREATER THAN THE SPEED OF RECORDING

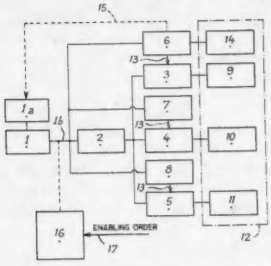
Yves Faisandier, Paris, France, assignor to C.M. Industries, Paris, France

Filed May 8, 1979, Ser. No. 36,986
Claims priority, application France, May 12, 1978, 78 14293
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—703 **10 Claims**

1. A method of processing and displaying an electrocardiogram signal that has been recorded at a first speed, comprising the steps of:

reading said recorded signal at a speed greater than the first speed of recording;

selectively and simultaneously detecting the occurrence of a



plurality of types of pathological complexes from the read signal; and

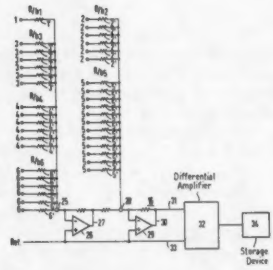
simultaneously displaying a signal sequence of said read signal for each detected pathological complex at respective different ones of a plurality of distinct display locations.

4,275,743

MEASURING DEVICE FOR MEASURING THE BIOELECTRICAL ACTIVITY OF THE CENTRAL NERVOUS SYSTEM

Bo Hjort, Sollentuna, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 11, 1979, Ser. No. 57,127
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1978, 2831412
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—731 **4 Claims**



1. Measuring apparatus for measuring bioelectrical activity of the central nervous system, said apparatus comprising a multiplicity of electrodes (**0**, **1** through **6**) arranged in an area array for providing an extensive covering pattern for an exterior application surface of a patient, said area array having a midpoint at one of the electrodes (**1**) for alignment with respect to an interior point beneath the patient exterior application surface whose potential is to be measured, the electrodes (**0**, **2** through **6**) being arranged at a multiplicity of different distances from the midpoint of the area array such that the electrodes of the area array exhibit a multiplicity of different distances from such interior point during a measurement operation, and means (**1'–6'**, **16**) coupled with the respective electrodes (**0**, **1** through **6**) and responsive to the potentials of the respective electrodes during a measurement operation to transmit weighted potentials in accordance with the potentials of the respective electrodes but with a relative weighting thereof

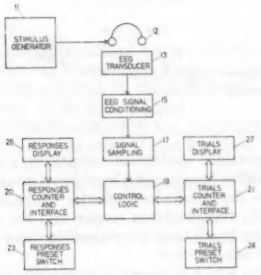
in accordance with a multiplicity of respective different weighting factors corresponding to the spreading out of a hypothetical potential emanating from such interior point via respective paths penetrating the tissue layers between such interior point and the respective electrodes at the patient exterior application surface, and sum the weighted potentials for the respective electrodes such that a sum signal is produced essentially exclusively representing the magnitude of the potential at the interior point.

4,275,744

AUDITORY RESPONSE DETECTION METHOD AND APPARATUS

Aaron R. Thornton, Boston, Mass., and Jerry Obenour, Sherman, Tex., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Nov. 19, 1979, Ser. No. 95,552
Int. Cl.³ A61B 5/00
U.S. Cl. 128—731 **22 Claims**



1. Apparatus for generating data from which the likelihood of hearing impairment can be determined in a human subject who receives a selected auditory signal and whose response thereto is detected by an electroencephalographic transducer, comprising:

(a) sampling means for sampling the polarity of the electroencephalographic signal at predetermined times after the time of application of the selected auditory signal which correspond to the positive and negative peaks of the waveform of the expected response component of the electroencephalographic signal, said sampling means providing a response output pulse when the polarity of the sampled signal matches the polarity of the expected response waveform at the predetermined time and also providing a trial output pulse at the time of each sample;

(b) synchronizing means responsive to the auditory signal for triggering the sampling means at the appropriate predetermined times;

(c) a response counter receiving the response output pulses from said sampling means and counting the pulses received by it and providing an output signal which is indicative of the total number of pulses counted; and

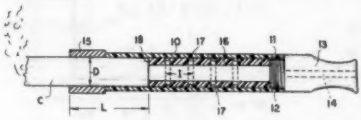
(d) a trial counter receiving the trial output pulses from said sampling means and counting the number of pulses received by it and providing an output signal indicative of the total number of pulses counted, whereby an operator can determine the ratio of the number of response pulses to the number of trial pulses over a selected period of time to provide a measure of the likelihood that a response is being evoked in a subject by the auditory signals.

4,275,745

CIGARETTE HOLDER

Giorgio Carosone, 738 Arnow Ave., Bronx, New York, N.Y. 10467

Filed Mar. 25, 1980, Ser. No. 134,148
Int. Cl.³ A24F 13/04
U.S. Cl. 131—270 **11 Claims**



1. A cigarette holder comprising:

an outer tube having a cylindrical inner wall of a diameter equal generally to that of a cigarette, a front end, and a rear end;

a mouthpiece at said rear end, whereby a cigarette can be inserted into said front end and smoke therefrom drawn through said mouth-piece;

an inner element in said interior extending forwardly from said rear end and having a front face forming a backward stop for a cigarette inserted into said front end, whereby a cigarette can only be inserted backwardly into said front end until engagement with said front face;

means including a succession of longitudinally spaced formations along said element for longitudinally shortening said element by breaking at said formations and thereby moving said front face backwardly, whereby when said element is shortened, more of a cigarette can be inserted into said outer tube and;

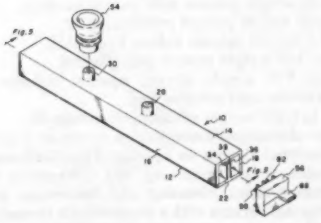
means at said front end for extinguishing a cigarette which is received in said outer tube and has burned down to said front end.

4,275,746

COMBINED INCENSE BURNER AND PIPE

Morton A. Gruber, 188 Haypath Rd., Old Bethpage, N.Y. 11804

Filed Mar. 1, 1979, Ser. No. 16,449
Int. Cl.³ A24F 3/00, 13/12
U.S. Cl. 131—180 **13 Claims**



1. A smoking device comprising:

a substantially rectangularly shaped elongated box having a top wall, a pair of side walls, an end wall, a bottom wall and having the other end thereof open;

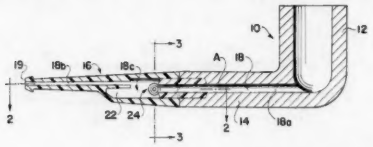
a removable end cap for substantially closing said open end;

said top wall including at least one stud on the exterior thereof extending upwardly, said stud having an aperture there through communicating with at least a portion of the interior of said box, means to support a smoking substance on said stem, an elongated divider wall means within said box, said divider wall means running substantially the entire length of said box and dividing the interior laterally into two substantially equal elongated compartments.

4,275,747
SMOKING PIPE

William L. Miller, 70 West Dr., Congress Lake, Hartville, Ohio 44632

Filed Aug. 30, 1979, Ser. No. 70,974
Int. Cl.[3] A24F 5/04
U.S. Cl. 131—195 4 Claims



1. A smoking pipe comprising a pipe bowl and an elongated stem extending from the bowl, said stem having an outlet opening and a longitudinal smoke-conducting passage communicating between the bowl and the outlet opening, and a metal air injection pin in the stem, said pin having an outer portion embedded in the stem, an outer surface essentially flush with the outer surface of the stem, an inner portion extending into the smoke-conducting passage beyond an inner wall of the stem forming the smoke-conducting passage and terminating within the passage adjacent the longitudinal center thereof, and a central air passageway in the pin extending perpendicular to the longitudinal extent of the stem, the central passageway having a diameter small relative to that of the longitudinal smoke-conducting passage and the embedded outer portion of the pin having a significantly larger cross sectional area than the extending inner portion to conduct heat at a greater rate than the inner portion.

4,275,748
METHOD AND COMPOSITION FOR MODIFYING FILAMENTOUS KERATINS

Helen V. Graziano, 332 W. Kathleen Dr., Park Ridge, Ill. 60068

Filed Jan. 28, 1980, Ser. No. 116,054
Int. Cl.[3] A45D 7/00
U.S. Cl. 132—7 10 Claims

1. A method of modifying filamentous keratins which comprises contacting said keratins with an effective amount of a modifying composition consisting essentially of:

from about 58 to 60 weight percent water;

18 to 20 weight percent milk protein product;

6 to 6.25 weight percent polysaccharide;

5 to 6.5 weight percent sodium hydroxide;

4.75 to 5.25 weight percent polyglycerol;

4.75 to 5.25 weight percent aqueous collagen polypeptide/amino acid solution; and

0.075 to 0.095 weight percent polysorbate-80;

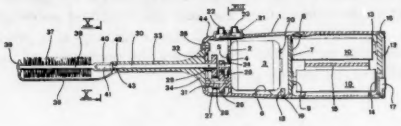
thereafter allowing said composition to remain in contact with said filamentous keratins for a period of time sufficient to effect modification thereof, removing said composition from said filamentous keratins, cleansing said filamentous keratins by contacting said keratins with a water-soluble cleansing composition, and removing said cleansing composition after cleansing is effected.

4,275,749
ELECTRICALLY DRIVEN CONTINUOUS TOOTH BRUSH

Celso Caroli, Via Sardegna, 16, Savignano sul Panaro (Modena), Italy

Filed May 14, 1979, Ser. No. 38,842
Claims priority, application Italy, Jun. 5, 1978, 40086 A/78
Int. Cl.[3] A45D 24/00
U.S. Cl. 132—11 A 8 Claims

1. An electric, continuously driven tooth brush comprising a handle to be grasped by a user; a hollow stem extending from said handle; a reversible electric motor housed in said handle; a rotatable shaft connected to said electric motor to be rotated thereby extending axially through said stem, said shaft having an end extending beyond said stem; an interchangeable cylindrical brush body; means for removably fixing said brush body



to said end of said shaft; a protective cap for the mucous membrane and tissues of the mouth, said cap extending over said cylindrical brush body along it length and over substantially a 180° arc; and means for supporting the tooth brush when not in use with said cap and said brush body in a antiseptical solution.

4,275,750
SELF-CONTAINED TOOTHBRUSH

Ben L. Clark, 1306 Brookside Dr., Danville, Calif. 94526

Filed Sep. 24, 1979, Ser. No. 78,540
Int. Cl.[3] A45D 48/18
U.S. Cl. 132—84 B 5 Claims

1. A self-contained toothbrush comprising: a brush element including a hollow handle and a brush head integral to one end of the handle, the interior and exterior of the hollow handle being generally trapezoidal in section and the peripheral dimensions of the brush head not exceeding those of the handle when viewed axially;

a hollow cap which is generally trapezoidal in interior and exterior section, said hollow cap being frictionally engageable with the handle so that the cap encloses the brush head, the trapezoidal interior dimensions of the cap matching the exterior dimensions of the brush head;

a base which is generally trapezoidal and is frictionally engageable with the end of the handle opposite from the brush head; and

a dentifrice container attached to the base at one end and having an opposite end with an opening for the dispensing of dentifrice, said container projecting from the base so that the container is located within the hollow handle when the base is attached to the handle, the exterior peripheral dimensions of the container being generally trapezoidal in section and conformed to match the internal dimensions of the hollow handle to maximize the size of the container and seal the opening of the container when it is enclosed by the handle.

4,275,751
COIN SORTER WITH EXPANDED CAPABILITY

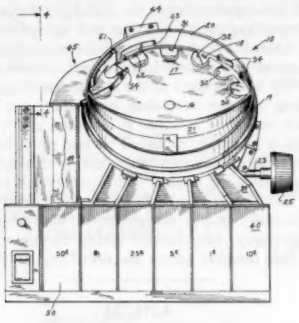
Charles T. Bergman, Watertown, Wis., assignor to Brandt, Inc., Watertown, Wis.

Filed May 10, 1979, Ser. No. 37,494
Int. Cl.[3] G07D 3/16
U.S. Cl. 133—3 C 11 Claims

1. In a coin sorter including a hopper, an inclined rotating plate disposed in said hopper and having means at its periphery to carry coins one at a time to a coin opening adjacent the apex of the rotating plate, a rotating drum which receives coins at the coin opening and which sorts the coins into respective denominations by size, the improvement therein comprising:

an exit chute having an outlet disposed outside said hopper

and having an entrance spaced above the surface of the rotating plate at a point beyond the apex of said plate and in the path of travel of coins carried thereon; and



deflection means disposed in front of said entrance and adapted to lift coins of a size greater than the coin opening from said rotating plate and to direct the same to the entrance of the exit chute.

4,275,752

FLUID FLOW APPARATUS AND METHOD

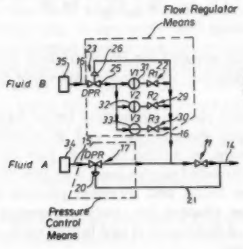
Nigel A. Collier, 13 Frome Close, Cove, Farnborough, Hampshire, England, and John H. Clements, 9 Krooner Rd., Camberley, Surrey, GV15 2AP, England

Filed Sep. 24, 1979, Ser. No. 78,461

Claims priority, application United Kingdom, Sep. 22, 1978, 37832/78

Int. Cl.³ G05D *11/00*

U.S. Cl. 137—7 **8 Claims**



1. A method of combining fluid flows comprising the steps of:

passing a flow of a first fluid through a controlled variable flow restriction;

combining the output of said first fluid from the controlled flow restriction with a flow of a second fluid;

passing the combined flow of the first and second fluids through a main flow restriction;

sensing the pressure of said combined flow downstream of said main flow restriction;

varying the rate of flow of the second fluid relative to the rate of flow of the first fluid so as to vary the proportions of the fluids combined together; and

varying said controlled variable flow restriction, and thereby the flow of said first fluid, in dependence upon said sensed pressure at the output of said main flow restriction in such a manner as to maintain substantially constant the pressure across the main restriction and to maintain substantially constant the rate of flow of the output of combined fluids from the main restriction despite changes in the rate of flow of the second fluid which is being combined with the first fluid.

4,275,753

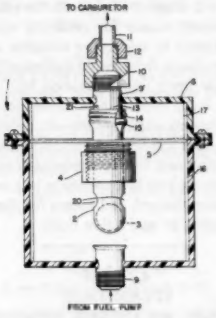
FUEL LINE CUT-OFF SWITCH

Robert J. Williams, 716, 12th St., Baraboo, Wis. 53913

Filed Oct. 24, 1979, Ser. No. 87,766

Int. Cl.³ F16K *17/36*

U.S. Cl. 137—45 **14 Claims**



1. A fuel cut-off switch comprising collapsible fuel line means for conveying fuel when said switch is in a first position and means for collapsing said collapsible fuel line means along at least a portion thereof to cut off fuel flow therethrough when said switch is tilted a predetermined amount from said first position, said means for collapsing being supported independently of said collapsible fuel line means.

4,275,754

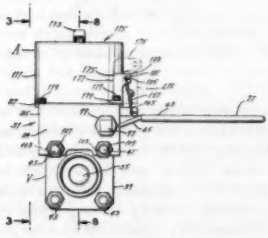
AUTOMATIC VALVE ACTUATOR

Jerry L. Lyons, and Denny W. Mertz, both of St. Louis County, Mo., assignors to Essex Cryogenics of Missouri, Inc., St. Louis, Mo.

Filed Aug. 1, 1978, Ser. No. 930,051

Int. Cl.³ F16K *17/40*

U.S. Cl. 137—75 **18 Claims**



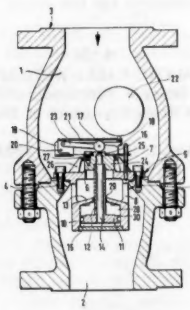
1. A valve actuator for preselected automatic actuation of a rotary-actuated valve in response to an occurrence of specific exigent type, said valve having a body, a valve element rotatably movable in said body, an actuating shaft extending from said body and rotatable for rotating said valve element between first and second positions, said actuator comprising: shaft coupling means for coupling rotational force to said shaft for rotation thereof only when said coupling means is rotated, a coiled torsion spring for applying a spring force to said coupling means for biasing said coupling means for rotation, camming means for operatively preventing rotation of said coupling means responsive to said spring force when secured and for operatively permitting rotation thereof responsive to

said spring force when released, an enclosure for surroundingly and protectively enclosing said coiled torsion spring and said camming means for protection from the elements, said spring having a plurality of coils wholly within said enclosure, a releasable link for securing said camming means against movement, said link being positioned exteriorly of said enclosure in a visible, replaceable position for permitting observation and replacement of said link without removal of said enclosure, said link releasing said camming means upon said exigent occurrence, said link comprising at least two portions normally joined and adapted to separate for releasing action of said link, securement means for retaining each of said link portions in attachment to said valve actuator upon separation to prevent said portions from being ballistically thrown from said valve actuator upon said separation but said securement means permitting facile manual installation and removal of said link, said link portions each having an apertured end, said actuator having a first and second link securement member for respectively securing said link by applying force via said apertures and for retaining said link members in a secured relationship upon separation thereof, and means for direct securement of said valve actuator to said valve body.

4,275,755
STEAM TRAP

Werner Foller, Stuhr, and Hermann Symanczyk, Langwedel, both of Fed. Rep. of Germany, assignors to Gestra-KSB Vertriebsgesellschaft mbH & Co. KG, Bremen, Fed. Rep. of Germany

Filed Oct. 19, 1979, Ser. No. 86,965
Int. Cl.³ F16T 1/20
U.S. Cl. 137—195 **7 Claims**



1. In a steam trap of the type mounted between a supply pressure chamber and a low pressure chamber, and including a main valve seat disposed between said supply and low pressure chambers, a main locking member disposed in said supply pressure chamber for cooperation with said main valve seat, a pilot pressure chamber housing defining a pilot pressure chamber, a pressure-responsive adjustment member disposed in said pilot pressure chamber, said adjustment member being coupled to the main locking member by means of a shaft, said shaft having a control conduit longitudinally-extending therethrough which has an inlet opening in said main locking member and which establishes communication between said supply pressure chamber and said pilot pressure chamber, a pilot valve seat provided on said main locking member at the inlet opening of said control conduit, a pilot locking member disposed for cooperation with said pilot valve seat and an actuating device being controlled by, and responsive to, the condensate to be discharged by said steam trap, the improvement comprising:

said main valve seat being provided in a seat element which supports the pilot pressure chamber housing on a neck member having outflow openings for the condensate and said pilot pressure chamber housing being freely suspended in said low pressure chamber;

said pilot locking member comprising a slide member;

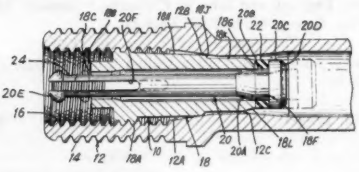
said trap having a pivot lever extending laterally across said main locking member in the locking position thereof and having a fixed pivot axis at one end thereof while the other end thereof is engaged by said actuating device; and

said trap having a drag lever which extends substantially laterally with respect to the stroke direction of said main locking member, said drag lever having a first end on which said slide member is mounted and a second end which is pivotably mounted on said pivot lever at a distance from said pivot axis thereof, so that upon actuation by said actuating device, said pivot lever is pivoted about said fixed pivot axis thereof, in turn, effectively causing substantially lateral movement of said drag lever and, consequently, substantially lateral sliding movement of said slide member across and off of said pivot valve seat.

4,275,756
PLASTIC VALVE CORE

Rodney J. Cairns, Altavista, and Stefan P. Whitelaw, Lynchburg, both of Va., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 20,102, Mar. 12, 1979, abandoned. This application Jul. 2, 1980, Ser. No. 165,306
Int. Cl.³ F16K 15/20
U.S. Cl. 137—234.5 **6 Claims**



1. A valve core adapted for incorporation within a valve stem or body having interior threads, said valve core comprising

a unitary molded plastic cylindrical barrel having an axial bore extending therethrough, and an external threaded portion thereon, at a first or outer part of said barrel, adapted for threaded engagement with the interior threads of said valve body, said threaded portion including an oblong bridge adapted for ready engagement by a tool, the first end of said barrel at said bridge having an opening from said bore;

means for providing that the second or inner part of said barrel is adapted by itself to effect the required static seal with respect to said valve body, said means including an inwardly tapered internal portion of said valve body;

a broad planar annular surface area of contact defined between the inner and outer peripheries at the second or inner end of said barrel;

a unitary elongated cylindrical valve pin with enlarged inner and outer ends, the inner end being cylindrical, said pin being disposed within said barrel in an axial relationship therewith, and said pin being slidably received within said bore;

said valve pin having adja nt its second or inner end a conical portion whose greatest diameter is substantially equal to the bore diameter, and having a cylindrical portion immediately below the conical portion, the cylindrical portion having a diameter substantially equal to said greatest diameter;

a cylindrical sealing washer surrounding said lower cylindrical portion of said valve pin and having a corresponding broad planar upper surface for contacting said broad planar annular surface area of contact defined at the inner

end of said barrel, the outer diameter of said sealing washer being substantially equal to the diameter at the outer periphery of the inner end of said barrel, the lower surface of said sealing washer being adapted to engage the integral, cylindrical, enlarged inner end of said pin, said end having a fixed diameter substantially equal to the outer diameter of said washer, whereby said washer is compressible against said broad planar annular contact area in sealing relationship therewith by movement of said pin axially outwardly.

4,275,757

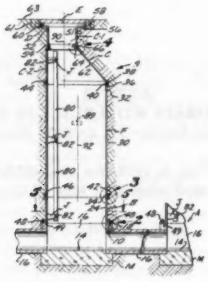
MANHOLE STRUCTURE AND METHOD OF MAKING SAME

Frederic J. Singer, 715 S. Nakoma Dr., Santa Ana, Calif. 92704

Filed Aug. 6, 1979, Ser. No. 63,996

Int. Cl.³ E02D *29/12*

U.S. Cl. 137—363 **17 Claims**



1. In combination with a plurality of longitudinally spaced manhole foundations located at the bottom of a plurality of excavations, said manhole foundations each having a flat upper horizontal surface from which a plurality of circumferentially spaced stud bolts extends upwardly, said manhole foundations having passages formed therein that communicate with sloping sections of pipe that extend between said manhole foundations, a plurality of multi-piece prefabricated manhole components formed from a cured mixture of a polyester resin and fiberglass that are at least partially assembled in said excavations to define dimensionally stable manhole structures that rest on said foundations and extend upwardly therefrom to a traffic cover located at street grade, each of said manhole structures including:

a. a base component that includes a ring-shaped first flange that has an inner periphery and a plurality of circumferentially spaced openings therein through which said stud bolts extend when said first flange rests on said flat horizontal surface of one of said foundations, a cylindrical first wall that extends upwardly from said inner periphery to develop into a circular outwardly extending first body shoulder, and a second cylindrical wall that extends upwardly from a circular outer extremity of said body shoulder, said second cylindrical wall of substantially less height than said first cylindrical wall;

b. a top assembly component that removably supports said traffic cover and extends downwardly therefrom, said top assembly including a cylindrical wall member on the lower extremity thereof;

c. a riser component that includes a cylindrical shell that has an upper portion and a lower portion, said upper portion including an outwardly extending second body shoulder that has a cylindrical wall piece extending upwardly from the outer periphery thereof, said cylindrical wall member of said top resting on said second body shoulder and cooperating with said cylindrical wall piece to define a first annulus space therebetween and said lower portion of said riser resting on said first body shoulder and cooperating with said second cylindrical wall to define a second annulus space therebetween;

d. first resilient means in said first annulus space for removably effecting a seal between said cylindrical wall member of said top assembly and said cylindrical wall piece on said upper portion of said riser;

e. second means in said second annulus space for bonding and sealing said lower portion of said riser to said base;

f. third means for sealing said flange of said base to said horizontal surface of said foundation; and

g. a plurality of nuts that engage said stud bolts to secure said flange of said base to said foundation.

4,275,758

PRESSURE CONTROL VALVE ASSEMBLY

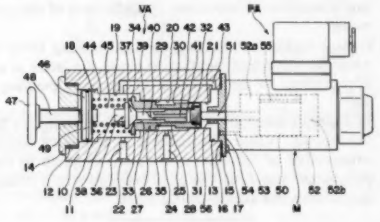
Kenji Masuda, Takatsuki, Japan, assignor to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Dec. 27, 1979, Ser. No. 107,620

Claims priority, application Japan, Dec. 28, 1978, 53/162962; Nov. 14, 1979, 54/148028

Int. Cl.³ F16K *17/06*

U.S. Cl. 137—489 **21 Claims**



1. A pressure control valve assembly which comprises, in combination:

a valve housing having a substantially elongated compartment defined therein, said compartment being divided into a large diameter bore and a reduced diameter bore with a first radially extending annular face defined therebetween, said large and reduced diameter bores being coaxial with each other;

a substantially elongated movable valve seat member having its opposite ends formed into a large diameter portion and a reduced diameter portion with a second radially extending annular face defined therebetween, said movable valve seat member being axially movably housed within the compartment with said large and reduced diameter portions movably, but fluid-tightly inserted respectively in the large and reduced diameter bores, said compartment with the movable valve seat member so housed therein having a valve chamber defined within the large diameter bore and positioned between one of the opposite ends of the compartment and a free end of the large diameter portion opposite to the reduced diameter portion, a first annular working chamber defined within the large diameter bore around the reduced diameter portion and between the first and second annular faces, and a back pressure chamber defined within the reduced diameter bore and positioned between the other of the opposed ends of the compartment and a free end of the reduced diameter portion opposite to the large diameter portion, said large diameter portion having an axially extending blind hole defined therein and having its opening facing towards the valve chamber;

a fluid inlet port means and a fluid outlet port means both defined in the valve housing, said fluid outlet port means being communicated to the valve chamber and leading to the outside of the valve housing;

a first passage means defined in the movable valve seat member, said blind hole being communicated through the

first passage means to the fluid inlet port means irrespective of the axial movement of the movable valve seat member;

a second passage means extending between the valve chamber and the back pressure chamber for balancing the pressure within the valve chamber and the pressure within the back pressure chamber with each other;

a valving means operatively housed within the valve chamber for displacement in a direction axially of the blind hole for selectively opening and closing the opening of the blind hole;

a primary biasing spring interposed between said one of the opposite ends of the compartment and the valving means for biasing the valving means in one direction to close the opening of the blind hole, said valving means being displaced in the opposite direction to open the opening of the blind hole against the primary biasing spring to communicate the fluid inlet port means to the fluid outlet port means through the blind hole and then through the valve chamber when the pressure inside the blind hole attains a predetermined value sufficient to overcome the biasing force of the primary biasing spring;

means for exerting an axial pushing force to be applied to the movable valve seat chamber to move the latter in a direction towards said one of the opposite ends of the compartment;

a biasing means for exerting an axial biasing force on the movable valve seat member to move the latter in a direction counter to the direction of the axial pushing force; and

a fluid circuit incorporated in the valve housing for holding the movable valve seat member in a state of equilibrium irrespective of variation in pressure supplied to the inlet port means and when the axial biasing force is counterbalanced with the axial pushing force.

4,275,759

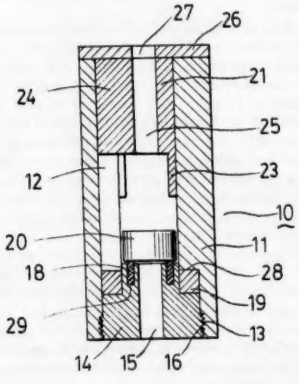
CLOSURE MEMBER

Shih C. Huang, No. 1, Chung-Shon S. Rd., Taipei, Taiwan

Filed May 29, 1979, Ser. No. 43,150

Int. Cl.³ F16K *15/02*

U.S. Cl. 137—528 **5 Claims**



1. A closure member comprising:

a cylindrical casing having a plurality of stripe recesses formed on the inner surface thereof and a section of female threads formed on the lower portion of the inner surface thereof;

a valve seat having a central passage, a male threads being formed on part of the outer surface thereof for engaging with said female threads on the casing and a flange portion projecting from the upper surface of the valve seat;

a ring magnet sleeved on the flange portion of said valve seat;

a piston movably positioned in the casing and biased toward said valve seat by the magnetic force of said ring magnet;

an inner tube having a plurality of supports extending from the bottom surface thereof for positioning the piston and a plurality of stripe protrusions coincident with the stripe recesses in the casing; and

a base cover for assembling the inner tube having a central openiing formed thereon.

4,275,760

TRAP-TYPE DRAIN WITH BUILT-IN STRAINER

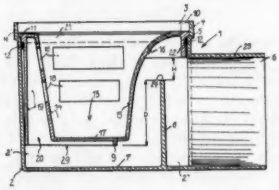
Bernhard Kessel, Ingolstädter Str. 20, 8073 Kösching, Fed. Rep. of Germany

Filed Dec. 8, 1978, Ser. No. 967,853

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1977, 2755174

Int. Cl.³ E03B *3/18*

U.S. Cl. 137—546 **1 Claim**



1. A drain trap comprising:

an upwardly open four-sided outer vessel with a closed bottom, one side of said outer vessel being provided with a lateral outlet extending from said bottom to a high point close to an upper rim thereof;

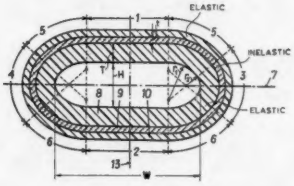
a partition parallel to said one side in said outer vessel rising from the bottom thereof and having an overflow edge at a level below said high point, said partition dividing the interior of said outer vessel into a first compartment remote from and a second compartment proximal to said outlet; and

an open-topped insert suspended by a closely fitting collar from said rim in sealed relationship with said outer vessel while terminating above the bottom thereof, said insert extending below said level into said first compartment and forming a downwardly converging, generally frustopyramidal closed-bottom inner vessel with a solid wall spacedly confronting said partition and with three other walls having peripheral apertures in the vicinity of said level, said insert further forming a skirt depending from said collar while spacedly surrounding said three other walls and defining therewith a laterally closed but downwardly open chamber while leaving said solid wall exposed, said partition enabling liquid issuing from said apertures to escape into said outlet across said overflow edge while accompanying solids are retained in an imperforate lower part of said inner vessel.

4,275,761
DUCT ASSEMBLY FOR ROTOR-POWERED MOBILE SPRINKLER

Kurt Waldhauser, Voitsberg, Austria, assignor to Ing. Waldhauser Maschinenfabrik Ges.m.b.H. & Co. KG, Maria Lankowitz, Austria

Filed Apr. 27, 1979, Ser. No. 34,205
Claims priority, application Austria, Jan. 8, 1979, 141/79
Int. Cl.³ F16L *55/14*
U.S. Cl. 137—595 **3 Claims**



1. In a squeeze-duct assembly with two juxtaposed, substantially identical resiliently deformable conduits traversing a rigid housing with two sidewalls having oppositely curved bulges centered on an axis of rotation of a valve body in said housing, said valve body being disposed between said conduits and carrying three angularly equispaced pressure rollers for alternately compressing said conduits against said sidewalls to block the passage of a fluid therethrough,

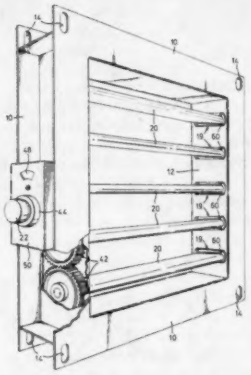
the improvement wherein each of said conduits has an elongated substantially oval cross-section in its uncompressed state, said cross-section having two generally planar legs paralleling said axis and C-shaped end zones interconnecting said legs, each conduit consisting of an inner tube of elastomeric material, an intermediate tube of substantially inelastic synthetic-resin fabric and an outer tube of elastomeric material all bonded to one another, said inner tube having a wall thickness at least equal to the combined wall thickness of said intermediate and outer tubes, the spacing of said rollers from said sidewalls at their points of closest approach equaling the thickness of either conduit in a flattened state in which said legs are in full internal surface contact with each other, each of said end zones having a central region with a relatively small radius of curvature and a pair of flanking regions with a relatively large radius of curvature connecting the respective central region with said legs.

4,275,762
CONTROL DAMPER

Sydney J. Field, Ashford, England, assignor to Actionair Equipment Limited, Whitstable, England

Continuation of Ser. No. 862,920, Dec. 21, 1977, abandoned. This application Aug. 20, 1979, Ser. No. 67,820
Claims priority, application United Kingdom, Dec. 22, 1976, 53581/76
Int. Cl.³ F24F *13/14*
U.S. Cl. 137—601 **4 Claims**

1. A control damper for controlling the flow of gaseous fluid through a duct, said control damper comprising: a hollow metal frame defining an opening for the passage of fluid therethrough, a line of hollow, sheet-steel, aerofoil-section, open-ended blades arranged in said opening of said frame, a plurality of blade bearing components, one at each end of each blade, to support the blades on said frame for rotation about parallel axes extending longitudinally of the blades, said blades being swingable about said axes to open and close the said opening in the frame and to be movable at will to intermediate positions between fully-open and fully-closed positions, a shaft on each blade bearing component and a respective aperture in said frame to rotatably receive said shaft, an intermediate flange on each blade bearing component, a surface on said flange opposing the adjacent open end of the respective blade, a spigot projecting from said flange surface and shaped in cross-section to enter the said adjacent open end of the blade and to support that end of the blade for rotation about the longitudinal axis of the blade, a pair of spaced-apart flange-like ridges projecting from said flange surface of said blade bearing component to receive the extreme end-portion of the blade between them,

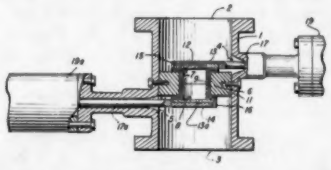


the ridges being in snug contact with said extreme end-portion, to give additional support to the blade end, and a plurality of rotary elements, one for each blade, keyed onto the blade bearing components at one side of said frame for the purpose of effecting swinging movement of the blades about their parallel axes, the said rotary elements being rotatable in unison to cause corresponding swinging movement of the blades between their fully-open and fully-closed positions.

4,275,763
DOUBLE-SLIDE VALVE

Robert J. Fahrig, Lansing, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 25, 1979, Ser. No. 42,543
Int. Cl.³ F16K *3/00, 47/08*
U.S. Cl. 137—613 **8 Claims**



1. A double-slide valve for use in a system for controlling the flow rate of a fluidized stream of particulate material, which comprises:

(a) a valve body forming a closed chamber having an inlet opening, an outlet opening and a pair of oppositely arranged valve stem openings positioned between said inlet and outlet openings;

(b) a flow port mounted within said valve body, the ends of said port constituting axially aligned entrance and exit openings through which said particulate material must pass and said flow port being in alignment with said inlet and outlet openings of said valve body;

(c) two traversably slidable valve plates, each connected to a valve stem which passes through said valve stem openings, each of said valve plates being greater in cross-sectional area than the cross-sectional area of said flow port;

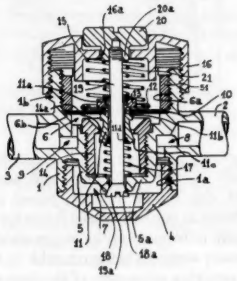
(d) guide means mounted adjacent to said flow port upon which said valve plates are slidably guided;
(e) control means attached to each of said valve stems for traversably sliding said valve plates across the entrance and exit openings of said flow port; and
(f) each of said traversably slidable valve plates adaptable to valve one of said entrance and exits openings of said flow port, respectively, in response to said respective control means.

4,275,764

COMBINATION PRESSURE REGULATOR AND MANUAL ON-OFF VALVE

Denis Baret, Saint Lager, France, assignor to Berthoud, S.A., Belleville sur Saone, France

Filed Jun. 13, 1979, Ser. No. 48,128
Int. Cl.³ F16K *31/145, 31/44*
U.S. Cl. 137—614.19 **6 Claims**



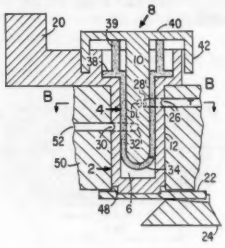
1. A combination valve unit comprising:
(a) a body having an inlet and an outlet, the body having a bore having a first portion communicating with said inlet and having a partition extending thereacross, and the bore having a second intermediate portion joined to the first bore portion at a shoulder, and the bore having a third portion opening into the atmosphere;
(b) a tubular member mounted in the intermediate bore portion against the shoulder and having an annular edge facing toward the third bore portion, the tubular member having a first valve seat located toward the body partition from said annular edge and having a second valve seat located toward said body partition from said first valve seat, and the tubular member having an opening located between the first valve seat and the annular edge and communicating with the body outlet;
(c) first valve means comprising a diaphragm and including means securing said diaphragm against said annular edge and separating the second and third bore portions, a first valve member supported by said diaphragm adjacent to said first valve seat and operative to restrict fluid flow through said seat when the diaphragm flexes toward said third bore portion under fluid pressure in said tubular member, a cap mounted in threaded relation to said third bore portion and axially adjustable therein, and spring means compressed between said cap and said diaphragm;
(d) second valve means comprising a stem extending through said partition and having a second valve member shaped to close said second seat, and spring means operative between said partition and said second valve member for normally closing said second seat; and
(e) actuating means supported outside the body and coupled with said stem and operative when actuated to displace the stem and second valve member away from the second valve seat.

4,275,765

DIRECTION CONTROL FLUSH VALVE

Roger A. Dugas, Chester, N.H., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 31, 1979, Ser. No. 108,629
Int. Cl.³ F16K *7/02*
U.S. Cl. 137—625.48 **10 Claims**



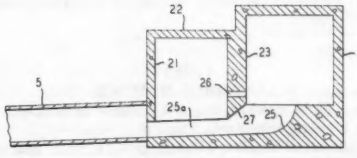
10. A mechanism for use in a valve assembly, comprising
a hollow stem closed at one end and open at the other,
means defining a pair of openings extending through the wall of said hollow stem,
means defining a groove in a wall of said hollow stem that communicates with said openings,
an elastomeric projection mounted within said hollow stem so as to block said openings when it is in a given condition of longitudinal stress,
means defining a port extending through the wall of said hollow stem, and
means for elongating said elastomeric projection so as to cause it to unblock said openings.

4,275,766

FLUID CONTROL SYSTEM

Harvey G. Aronson, 11 River Rd., Oceanside, N.Y. 11572

Continuation-in-part of Ser. No. 875,206, Feb. 6, 1978, abandoned. This application Jun. 29, 1979, Ser. No. 53,294
Int. Cl.³ F15D *1/02*
U.S. Cl. 138—37 **8 Claims**

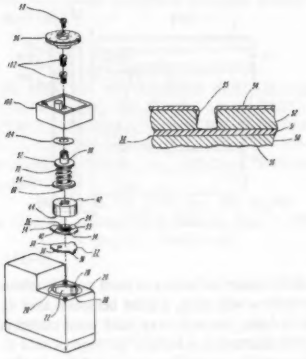


1. An energy reduction chamber for controlling the volumetric rate of fluid flowing in a conduit, said chamber including
(a) a bottom wall with a channel formed therein, said channel being adapted to communicate with said conduit,
(b) a downstream and an upstream wall formed transverse to said channel, each of said walls having an opening in its lower end adapted to permit undisturbed flow of fluid in said channel below a predetermined fluid level, and
(c) an orifice formed in said upstream wall for permitting fluid entry into said chamber defined by said walls when said fluid exceeds said predetermined level, thereby flooding said chamber and dissipating the velocity of said fluid so as to limit said volumetric rate of flow,
wherein the width of said chamber is at least three times the width of said channel.

4,275,767
FLUID RESISTOR

Norman R. Westfall, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Continuation of Ser. No. 421,136, Dec. 3, 1973, abandoned. This application Oct. 27, 1976, Ser. No. 736,069
Int. Cl.[3] F15C *1/06*
U.S. Cl. 138—40 11 Claims

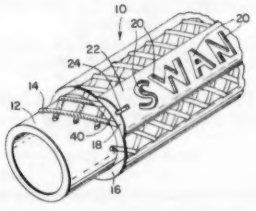


1. In the method of making a fluid resistor of the type wherein a capillary groove provides fluid resistance, and wherein said fluid resistor comprises first means having a first flat surface, second means having a second flat surface, and layer means having third and fourth equi-spaced opposing flat surfaces, and wherein said first means is relatively rigid and has said third flat surface fixed to its said first flat surface, said second means has its said second flat surface sealingly fitted to said fourth flat surface, and said first, second, third, and fourth flat surfaces being substantially parallel to one another and coextensive; the improvement comprising: providing said layer means in the form of a layer of material of uniform thickness by fixing such material everywhere to said first flat surface, and thereafter removing a portion of said layer of material from said first flat surface, whereby to provide said capillary groove; such removal creating an edge of said material remaining fixed to said first flat surface, said edge defining the shape of said capillary groove, and the thickness of said layer of material defining the thickness of said capillary groove.

4,275,768
HOSE HAVING ENGRAVED INDICIA STRIP

E. Gray Riggs, 709 Winmar Pl., E., Westerville, Ohio 43081; Joseph K. Simmonds, 4889 Kingshill Dr., Apt 103, Columbus, Ohio 43229, and Vernon D. Browning, 1692 Colonial Dr., Bucyrus, Ohio 44820

Filed Jun. 16, 1978, Ser. No. 915,918
Int. Cl.[3] F16L *9/04, 9/12, 55/00*
U.S. Cl. 138—104 2 Claims

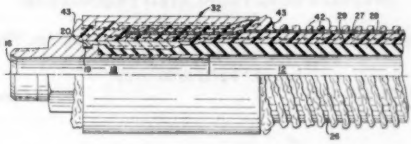


1. A hose comprising a first element in the form of a tube having an axis and a convex outer surface of a first surface appearance and of predetermined curvature with respect to said axis and a second element in the form of an opaque strip extending longitudinally of said tube and having a concave inner surface conforming and fused to less than the full circumference of the convex outer surface of said tube and a convex outer surface of a second, opaque surface appearance visually contrasting to said first surface appearance and having longitudinal edges coincident with the longitudinal edges of the concave inner surface of said strip and of predetermined curvature with respect to said axis which is sharper than that of the convex outer surface of said tube, so that said strip is of maximum radial thickness midway between its longitudinal edges, and indicia engraved in the outer convex surface of said strip but not extending through said strip.

4,275,769
FIREGUARD FOR HOSE ASSEMBLY

Horise M. Cooke, Weatherford, Tex., assignor to Stratoflex, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 80,567, Oct. 1, 1979, abandoned. This application Nov. 9, 1979, Ser. No. 93,140
Int. Cl.[3] F16L *35/00*
U.S. Cl. 138—109 5 Claims

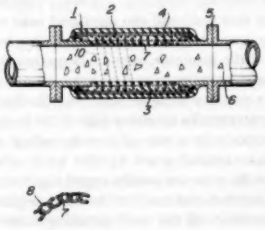


1. A fireguard for a hose and fitting assembly, the assembly including at least one fitting attached to an end of the hose, the fitting including an inner nipple and an outer socket, said fireguard comprising a tubular layer of a silicone compound having an internal diameter adapted to fit around a hose and fitting assembly to be protected, a tubular metal shroud substantially covering said tubular layer, a collar positioned around said shroud and said layer adjacent said fitting, and an additional outer layer of a silicone compound between said collar and the outside of said shroud and said tubular layer, said collar being adapted to secure said fireguard to said fitting.

4,275,770
WEAR RESISTANT RUBBER HOSE

Megumi Yamamoto, Yokohama, Japan, assignor to Bridgestone Tire Co., Ltd., Kyobashi, Japan

Division of Ser. No. 851,916, Nov. 16, 1977, Pat. No. 4,212,328. This application May 14, 1979, Ser. No. 38,959
Claims priority, application Japan, Feb. 18, 1977, 52-17973[U]; Oct. 17, 1977, 52-138052[U]
Int. Cl.[3] F16L *11/08*
U.S. Cl. 138—133 3 Claims



1. In a wear resistant rubber hose having a central longitudinal axis and comprising an inner layer of surface rubber, an

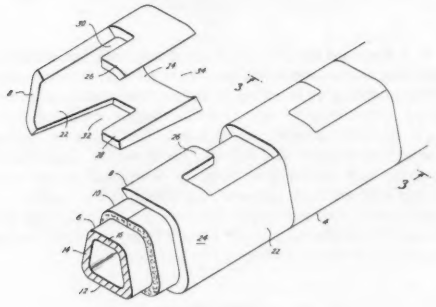
intermediate reinforcing layer surrounding said inner layer of surface rubber and an outer cover rubber layer surrounding said reinforcing layer, the improvements comprising: a continuous chain string having a ridigity considerably higher than that of said inner layer of surface rubber completely embedded inside the inner layer of surface rubber, said chain string being helically wound around the central longitudinal axis of the hose and comprising a plurality of individual planar links serially connected to one another and positionally disposed within the inner layer of surface rubber such that the planes of every other link are substantially parallel to the central longitudinal hose axis while the planes of the alternate, remaining links are substantially perpendicular to the central longitudinal hose axis, and wherein laterally adjacent links in the helically wound chain string are spaced from one another in the direction of the central longitudinal hose axis.

4,275,771

INTERLOCKING TRUNCATED TRIANGULAR INSULATOR

Frank Campbell, Jr., 2274 Broadlawn Dr., Houston, Tex. 77058

Filed Nov. 15, 1979, Ser. No. 94,611
Int. Cl.³ F27D *9/00, 3/02*
U.S. Cl. 138—149 **9 Claims**



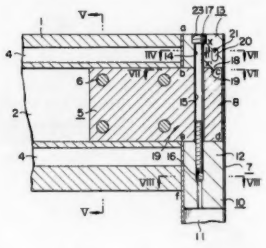
1. An interlocking, two-segment insulator for covering a pipe, the pipe having a base member, a pair of converging side members terminating in an apex member and whose perimeter defines a truncated triangular shape, the insulator comprising a base unit having first and second ends, a pair of side walls convergingly extending from the first and second ends of the base unit, the side walls terminating in and joining with an apex unit which connects the spaced apart side walls and each segment of the insulator includes a primary member forming a portion of one side wall and the apex and base units and circumferentially opened by a void corresponding to the remaining side wall of the insulator, a body extending longitudinally from the primary member, a pair of arms extending longitudinally from the primary member less than the body, the arms located circumferentially on either side of the body and spaced apart from the body by a pair of corresponding recesses, said arms themselves spaced apart by the void when properly aligned around the pipe are axially urged together, the void of each segment receives the body of the other segment and each pair of recesses receives the corresponding arms of the other segment thereby forming a truncated triangular, two-piece insulator which is maintained in place around the pipe without any other support means.

4,275,772

HEDDLE FRAME

Yoichi Shimizu, Izumishi, Japan, assignor to Kabushiki Kaisha Maruyama Seisakusho, Sakai, Japan

Filed Feb. 1, 1980, Ser. No. 117,572
Claims priority, application Japan, Sep. 3, 1979, 54-120466[U]
Int. Cl.³ D03C *9/06*
U.S. Cl. 139—91 **7 Claims**



1. In a heddle frame including at least one aluminum bar and at least one hollow side-stay, a joint between said at least one bar and said at least one side stay, said joint comprising:

a joint block inserted in a hollow portion of said at least one bar and partially extending from said bar in the direction of the length of said bar;

an opening in said at least one side-stay, said opening adapted to have a portion of said joint block inserted therein;

a pressure receiving piece fixed in said at least one side-stay and adjacent one side of said opening wherein one face of said joint block may contact said pressure receiving piece;

a pressing piece in said at least one stay and adjacent another side of said opening wherein another face of said joint block may contact said pressing piece;

bolt holes in said pressing piece and said joint block and a threaded hole in said pressure receiving piece, said holes being positioned so as to be axially aligned when said joint block is fully inserted in said opening of said side stay; and

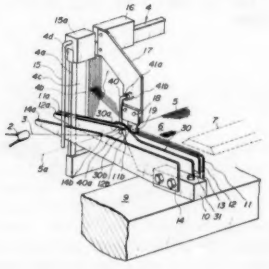
a clamping bolt insertable through said bolt holes and screwable in said threaded hole to secure said pressing piece, joint block and pressure receiving piece together.

4,275,773

WEFT CUTTING DEVICE IN SHUTTLELESS LOOM

Kazuo Shibata, Sagamihara, Japan, assignor to Nissan Motor Company, Limited, Tokohama, Japan

Filed Oct. 10, 1979, Ser. No. 83,548
Claims priority, application Japan, Oct. 12, 1978, 53/124658; Mar. 12, 1979, 54/27626
Int. Cl.³ D03D *47/34*
U.S. Cl. 139—429 **9 Claims**



1. A device for cuttings wefts in a shuttleless loom compris-

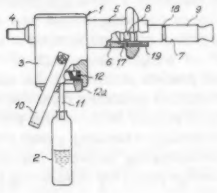
ing a plurality of juxtaposed weft guide members disposed on a side of a woven cloth, the weft guide members engaging the weft during and after beating so as to guide the weft toward the cloth fell, and a plate-like cutting member adapted to move synchronously with the loom between a pair of the guide members, the cutting member after the beating being caused to move across the weft engaged by the guide members and a further weft guide member is provided on the outer side of the pair of the weft guide members between which the cutting member moves.

4,275,774

METHOD AND AN APPARATUS FOR TRANSFERRING A REFERENCE LIQUID FROM AN AMPOULE TO AN ELECTROCHEMICAL MEASURING INSTRUMENT

Jørgen Andersen, Dyrespringvej 3, DK-2730 Herlev, and Ib Reimer-Nielsen, Solkær 23, DK-2610 Rødovre, both of Denmark

Filed Feb. 13, 1979, Ser. No. 11,947
Claims priority, application Denmark, Sep. 7, 1978, 3966/78
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—1 **11 Claims**



1. A method for transferring a reference liquid from a reference liquid-containing ampoule to an electrochemical measuring instrument comprising

(a) opening said ampoule,

(b) providing a discharge conduit having an inlet and an outlet and extending through the opening of the ampoule into the inner space thereof so as to position said inlet below the surface of the liquid in said ampoule,

(c) providing, at the surface of the liquid in said ampoule, a gas pressure exceeding the gas pressure at the outlet of the conduit so as to discharge liquid from the ampoule through said outlet and communicating the outlet with said measuring instrument so as to introduce reference liquid into said instrument,

(d) terminating the liquid introduction into the measuring instrument while the inlet of the conduit is still located below the surface of the reference liquid in the ampoule thereby substantially preventing the introduction of gas into said measuring instrument.

4,275,775

SYSTEM FOR THE ACCURATE DOSING OF BULK MATERIAL

Alwin Egli, Beringen, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

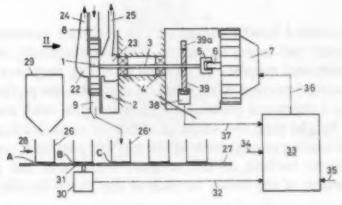
Filed Apr. 30, 1979, Ser. No. 34,533
Claims priority, application Switzerland, May 12, 1978, 5240/78
Int. Cl.³ B65B *1/32*
U.S. Cl. 141—83 **10 Claims**

1. In a dosing system for filling a receptacle with a predetermined desired weight of flowable bulk material, including a conveyor on which receptacles are forwarded consecutively in a direction of advance, a main dosing apparatus for charging each receptacle, in a main dosing station along the conveyor, with the bulk material to an extent less than the predetermined weight; the improvement comprising an additional dosing apparatus for complementing the receptacle, in an additional dosing station along the conveyor, with the bulk material to an extent equal to the deviation between said desired weight and the actual weight resulting from the charging by said main dosing apparatus; said main dosing station being situated upstream of said additional dosing station as viewed in said direction of advance; said additional dosing apparatus comprising

(a) a cellular dispensing wheel having a plurality of cells of predetermined volume;

(b) means defining a material inlet chamber and a material outlet chamber spaced from one another and bounding first and second circumferential portions of said wheel;

(c) a movably supported shroud member having a shroud face extending along a third circumferential portion of said wheel and separating said inlet and outlet chambers from one another;



(d) adjusting means for setting the position of said shroud member for determining a minimum clearance between said shroud face and the periphery of said wheel;

(e) spring means urging said shroud member towards said wheel for allowing a resilient yielding movement of said shroud member away from said wheel;

(f) a stepping motor coupled to said wheel for rotating the same to discharge the bulk material through said outlet chamber;

(g) weighing means for determining said actual weight of the receptacle in a weighing station along said conveyor upstream of said additional dosing station as viewed in said direction of advance; and

(h) motor actuating means operatively coupled to said weighing means and said stepping motor for rotating said wheel through as many cell divisions as necessary to fill the receptacle by said additional dosing device in said additional dosing station with a quantity of the bulk material corresponding in weight to said deviation.

4,275,776

AUTOMATIC HOLDING DEVICE FOR GASOLINE PUMP HANDLES

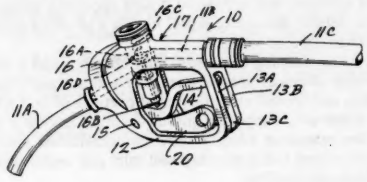
John W. Rehkopf, 1050 Leith, Maumee, Ohio 43537

Filed Aug. 17, 1979, Ser. No. 67,216
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—392 **1 Claim**

1. A gasoline pump handle holding device with a frontal portion and a posterior portion for longitudinal insertion in a gasoline pump handle support frame to hold the gasoline pump handle upwardly in an open position within said support frame, wherein the support frame has a flat surfaced bottom and is adapted for holding therein the gasoline pump handle, the lower surface of which gasoline pump handle is curved such that portions of the lower surface of such gasoline pump handle lie at a variable distance from the flat surface bottom of the support frame forming a lowest and a highest part, said handle holding device comprising:

(a) a longitudinally extending functional member, said longitudinally extending functional member having upper and

lower edges, said upper edge and lower edge being sloped downwardly towards the frontal portion thereof, thereby creating a forward portion which is shorter in height than the remaining portions of such holding device, and which forward portion is longitudinally insertible under the lowest part of the lower surface of the gasoline pump handle and above the flat surface bottom of the support frame;



(b) rounded handle means on the posterior portion of such upper and lower edges of said longitudinally extending functional member for manual handling purposes and said rounded portion is disposed on the posterior portion creating a rearward portion which is integral with and higher in height than the other portions of such holding device for mating engagement at the highest part between the flat bottom surface of the support frame and the posterier portion of the lower surface of the pump handle.

4,275,777

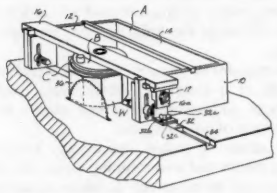
TABLE SAW CARRIAGE ATTACHMENT

Louis H. Briggs, Rte. 3, Box 198, Elberton, Ga. 30635

Filed Oct. 15, 1979, Ser. No. 85,050

Int. Cl.[3] B27C 5/06

U.S. Cl. 144—138 **8 Claims**



1. Accessory attachment apparatus for a table saw and the like for holding a workpiece for sawing and turning, said apparatus comprising:

a carriage means by which said workpiece is carried relative to said saw table and blade;

said carriage means including spaced apart sides;

bridge plate means extending between said sides;

index attachment means carried by said bridge plate means;

an attachment plate rotatably carried by said index attachment means to provide an axis of rotation about which said workpiece is turned for sawing;

connecting means for affixing said workpiece to said attachment plate;

index stop means for locking said attachment plate and index attachment means unitarily together in one of a plurality of predetermined rotational positions;

means for guiding said saw blade and carriage means relative to one another as said workpiece is presented in one of said plurality of rotated positions for sawing a planar surface thereon; and

said attachment plate including attachment means for attaching said attachment plate to a turning lathe so that said attachment plate and affixed sawed workpiece may be unitarily removed and attached to a turning lathe whereby said workpiece may be turned about said same axis of rotation to produce a highly symmetrical turned product.

4,275,778

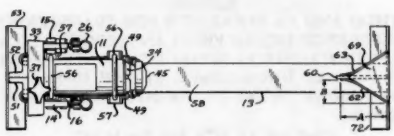
LOG SPLITTER

John A. Kotas, Chicago Heights, Ill., assignor to Desa Industries, Inc., Park Forest, Ill.

Filed Aug. 13, 1979, Ser. No. 66,083

Int. Cl.[3] B27L 7/00

U.S. Cl. 144—193 A **9 Claims**



1. A log splitting apparatus comprising a horizontally extending elongated beam having first and second ends, a hydraulic power pack mounted on the first end of the beam, a wedge assembly mounted on the second end of the beam, the wedge assembly including a vertically extending center plate extending parallel to the longitudinal axis of the beam and aligned with the power pack and secured to the second end of the beam, a pair of wedge plates, each of the wedge plates having a curved portion secured to the center plate and a substantially flat portion extending from the curved portion at an acute angle with respect to the center plate, and a triangularly shaped horizontally extending gusset plate on top of the center plate and extending between and engaging the flat portions of the wedge plates for reinforcing the wedge plates.

4,275,779

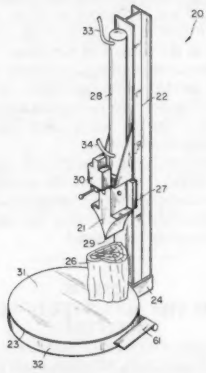
LOG-SPLITTING APPARATUS

William D. Rowe, 1825 Vermont Ave., Connersville, Ind. 47331

Filed Apr. 16, 1980, Ser. No. 140,729

Int. Cl.[3] B27L 7/00

U.S. Cl. 144—193 A **13 Claims**



1. An adjustable log-splitting apparatus of the type wherein a wedge-shaped cutter is slidably recieved on a vertical column, a log to be split is placed beneath the wedge-shaped cutter and drive means move the cutter into contact with the log, wherein the improvement comprises:

a base platform disposed beneath the wedge-shaped cutter and including a top plate member and a supporting frame member;

means for connecting said top plate member to said supporting frame member, said connecting means being arranged

to permit elevation of said top plate member relative to said supporting frame member and thereafter to permit manual rotation of said top plate member relative to said supporting frame member; and

elevating means for raising said top plate member relative to said supporting frame member.

4,275,780

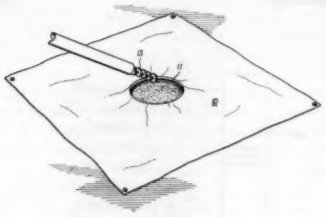
GRAIN AUGER HOPPER

Bert B. Tisdale, 4643 - 197th St., Langley, B.C., Canada

Filed Mar. 10, 1980, Ser. No. 128,888

Int. Cl.³ B65D *79/00*; B65G *65/34*

U.S. Cl. 150—52 R **8 Claims**



1. An auger grain hopper comprising:

a tarpaulin having a top surface upon which grain is piled and a bottom surface for covering the ground;

a receptacle positioned on the bottom surface of the tarpaulin;

means for securing the receptacle to the tarpaulin;

a lid for closing the receptacle with the tarpaulin disposed therein when the tarpaulin is not in use; and

stabilizing means on the lid for receiving the bottom of another receptacle therein whereby a plurality of receptacles may be stacked with tarpaulins contained therein.

4,275,781

CLEATED SNOW CHAIN

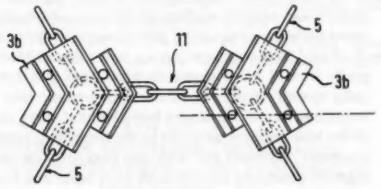
Tilo Riedel, Salzburg, Fed. Rep. of Germany, assignor to Sesamat Anstalt, Schaan, Liechtenstein

Filed Oct. 18, 1978, Ser. No. 952,652

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1977, 2747025

Int. Cl.³ B60C *27/00*

U.S. Cl. 152—224 **4 Claims**



1. A cleated chain wrapping for use on automotive tires which have a circumferentially extending tread surface and which are mounted on wheels which have a first side and a second side, comprising: an even plurality of like chain lengths extending transversely across the tread surface from the first side of the wheel to the second side of the wheel, the chain lengths being arranged in a plurality of chain pairs, in a manner that the pairs are spaced around the circumference of the tire in adjacent side-to-side relationship; a plurality of like cleats equal in number to the number of chain pairs, each cleat being located on the tread surface and connected between one of the chain lengths in a chain pair and one of the chain lengths in an adjacent chain pair, said ones being those chain lengths in said chain pairs which are located adjacent each other; and means securing the chain lengths between the first and second sides of the wheel, each cleat being formed of a first part associated with one of said ones and a second part associated with another of said ones, the parts being separate and mirror images of each other, and the parts being secured together by a connecting chain connecting said ones together.

4,275,782

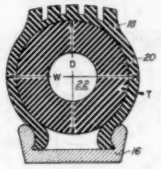
PNEUMATIC TIRE INSERTS

Richard B. McFarlane, 305 Hollywood Blvd., Oxnard, Calif. 93030

Continuation of Ser. No. 776,845, Mar. 24, 1977, abandoned. This application Jan. 16, 1979, Ser. No. 3,991

Int. Cl.³ B60C *7/00*

U.S. Cl. 152—314 **2 Claims**



1. A tire insert designed to be carried within a pneumatic tire casing mounted on a wheel rim, said tire insert comprising:

(a) a resilient annular member;

(b) having an internal annular bore means dimensioned such that said bore means defines an empty volume from 0.1444 to 0.3136 of the total volume of said member;

(c) said insert having a durometer hardness of between 30 and 65, as measured by a Type A Shore Durometer Testor, wherein

(d) if L is the total length of the mean circumference of said annular member and C is the total length of the mean circumference of said pneumatic tire casing on said rim, L is larger than C prior to insertion of said insert in said pneumatic tire casing, by an amount between 0.005 C and 0.013 C and wherein

(e) if D is the mean diameter of a cross-section of the resilient annular member, W the width of the casing at normally inflated conditions and T the wall thickness of the tire casing, under normally inflated conditions, then $D=W-2T$, whereby said insert is frictionally retained within said pneumatic tire casing against circumferential sliding movement relative to said tire casing when in use.

4,275,783

MOLDING MACHINE FOR FABRICATING BOXLESS MOLDS

Werner Geiger, Meggen, Switzerland, assignor to Inventio AG, Hergiswil, Switzerland

Filed Sep. 4, 1979, Ser. No. 71,945

Claims priority, application Switzerland, Sep. 5, 1978, 9318/78

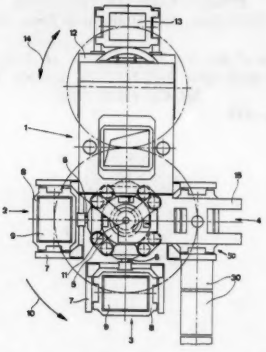
Int. Cl.³ B22C *11/04*, *17/08*

U.S. Cl. 164—146 **6 Claims**

1. A molding machine for fabricating boxless molds, comprising:

a number of mold stations defining a sand filling and compaction station coacting with an exchangeable match plate support, at least one core insert station and a mold closing station where two mold halves, forming a casting mold, are brought into superimposed alignment with one another;

a pivot device cyclically rotatable about a vertical axis for movement past said number of mold stations;
said pivot device being provided with at least three pivot arms each having a respective mold box for receiving a mold half, each mold box being rotatable about a substantially horizontal axis and vertically displaceable;
a conveyor device for transporting the molds; and
said conveyor device comprising a transport device structured as part of said closing station;
said closing station comprising:
a vertically centrally symmetrical arrangement, viewed



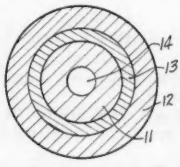
from the top towards the bottom, of an elevationally displaceable mold half-ejection punch;
a support arrangement including stationary support column means for a mold box lowered thereon by the pivot arm during a mold closing cycle at the closing station;
said support arrangement including fluid operated elements coacting with said support column means for supporting said mold box lowered onto said support column means;
said transport device comprising a support plate for receiving two mold halves forming a fabricated mold; and
an elevationally displaceable table for raising and lowering the support plate.

4,275,784

FAIL SAFE HEAT EXCHANGER

James M. Popplewell, Guilford, Conn., and Sheldon H. Butt, Godfrey, Ill., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 23,631, Mar. 26, 1979. This application Mar. 31, 1980, Ser. No. 135,543
Int. Cl.³ F28F *19/00, 21/08*
U.S. Cl. 165—134 R **7 Claims**



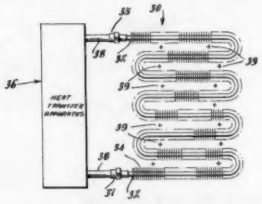
1. A composite fail safe metal heat exchanger comprising:
an inner metal tube comprising copper cr a copper alloy forming a fluid passageway;
an outer metal tube comprising copper or a copper alloy;
said inner and outer tubes being concentric;
a substantially continuous corrosion barrier;
said corrosion barrier comprising nickel or a nickel alloy which is noble to the metal of said inner and outer tubes;
said corrosion barrier being located between and in intimate contact with said inner and outer tubes; whereby said corrosion barrier is adapted to prevent intermixing between a fluid within said passageway with fluid surrounding said outer tube.

4,275,785

HEAT EXCHANGE TUBING BLADE ASSEMBLY

Leo J. Kerivan, Wellesley, Mass., assignor to Industrial Blast Coil Corporation, South Easton, Mass.

Continuation of Ser. No. 781,925, Mar. 28, 1977, abandoned. This application Sep. 20, 1979, Ser. No. 77,185
Int. Cl.³ F28F *1/14*
U.S. Cl. 165—183 **26 Claims**



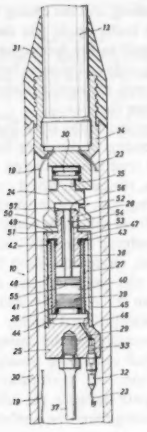
1. A heat exchange tubing and multiple heat exchange blade assembly comprising:
an elongated tube having a passage extending along the axis of the tube for accommodating fluid flow longitudinally within the tube;
said passage within said tube being defined by the inner surface of the wall of the tube,
said tube wall having a continuous rounded convex exterior surface as seen in cross section;
said inner surface of said tube wall describing a continuous rounded convex curve as seen in cross section;
said tube having a plurality of pairs of spaced parallel buttresses formed integral with the tube wall and extending longitudinally along the outside of the tube wall parallel with the tube axis and projecting outwardly above the exterior surface of the tube wall;
a plurality of blade strips extending longitudinally of the tube parallel to the tube axis, said strips being circumferentially spaced one from the other;
each of said blade strips having a base segment resting against said exterior surface of the tube and being captivated between a respective pair of said parallel buttresses;
each of said base segments having two rows of blades integrally formed thereon, said two rows being circumferentially spaced from each other relative to the tube with a respective row of the blades being located along each side of the base segment adjacent to the respective captivating abutment buttresses and with said two rows on each base segment extending parallel with each other and longitudinally along the tube;
said blades in the two rows on each base segment projecting outwardly away from the tube;
said blades being twisted near their base segment positioning the surface of each blade generally transverse to the tube for accommodating the passage of exterior fluid flowing generally transversely to the tube;
each base segment of each blade strip being pressed firmly into thermally conductive abutting contact with the exterior surface of the tube wall between its pair of parallel captivating buttresses by at least one of said abutments being crimped laterally toward the base segment and inwardly toward the exterior surface of the tube.

4,275,786

APPARATUS FOR SELECTIVELY COUPLING CABLES TO WELL TOOLS

Arley G. Lee, Pasadena, Tex., assignor to Schlumberger Technology Corporation

Filed Dec. 15, 1978, Ser. No. 969,916
Int. Cl.[3] E21B 47/00
U.S. Cl. 166—65 R 38 Claims



1. Well bore apparatus for releasably coupling a suspension cable to a well tool and comprising:

upper and lower support members adapted for intercoupling a suspension cable to a well tool;

selectively-releasable coupling means including at least one movable member normally positioned between said support members for cooperatively maintaining said upper and lower support members coupled in a tool-supporting relationship and adapted for movement away from that normal position whereby said support members will no longer be in a tool-supporting relationship, and electrically-operable securing means releasably retaining said movable member in its said normal position, said electrically-operable securing means including an electrically-disintegratable member formed of an unalloyed bimetallic composite of at least two exothermic metals and adapted to be parted upon passage of electrical current therethrough for releasing said movable member for movement away from its normal position;

means normally defining a fluid-tight chamber around said electrically-operable securing means; and

means operable in response to release of said movable member for movement from its said normal position for admitting well fluids into said chamber.

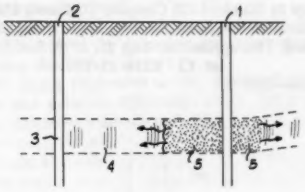
4,275,787

METHOD FOR MONITORING SUBSURFACE COMBUSTION AND GASIFICATION PROCESSES IN COAL SEAMS

Klaus Helbig, Zeist, Netherlands, assignor to Prakla - Seismos GmbH, Hanover, Fed. Rep. of Germany

Filed Jul. 25, 1979, Ser. No. 60,340
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1978, 2833598
Int. Cl.[3] E21B 43/243, 47/00
U.S. Cl. 166—251 5 Claims

1. A method for monitoring subsurface combustion and gasification processes in coal seams for the determination of the location of the combustion front and the amount of change of the electrical properties of coal during combustion and gasification comprising the steps of emitting radar signals from an elongated antenna in a borehole within the same coal seam, and recording the radar signals for a determination of their



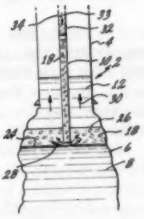
travel time and amplitude by at least one receiver antenna in a further borehole or by the transmitter antenna.

4,275,788

METHOD OF PLUGGING A WELL

Ronald E. Sweatman, Fountain Valley, Calif., assignor to BJ-Hughes Inc., Long Beach, Calif.

Filed Jan. 28, 1980, Ser. No. 115,870
Int. Cl.[3] E21B 33/38
U.S. Cl. 166—292 20 Claims



1. A method for forming a plug within a well bore, said method comprising the steps of:

establishing a two-phase system within the well bore in which a less dense phase bears against the upper surface of a more dense phase to provide an interface between the two phases that is positioned at a desired location for formation of a plug within the well bore;

injecting a hardenable plug material at about the interface between the two phases with the plug material having a density which is intermediate the densities of the less dense and more dense phases;

permitting the plug material to harden to form a plug within the well bore, whereby the plug material floats on the more dense phase during hardening as the plug material is squeezed between the less dense and more dense phases such that the plug material is compressed and is forced into contact with the surface of the well bore to bond securely to the well bore surface; and

wherein the more dense phase is a more dense liquid and the less dense phase is a less dense liquid which floats on the more dense liquid at the interface between the two liquids before injection of the plug material.

4,275,789

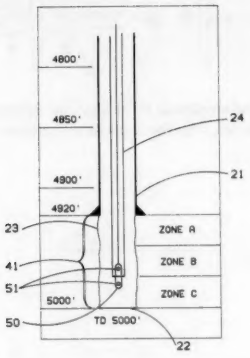
SILICATE ACTIVATED LIGNOSULFONATE GEL TREATMENTS OF CONDUCTIVE ZONES

Dan D. Lawrence, and Betty J. Felber, both of Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 939,579, Sep. 5, 1978, abandoned. This application Aug. 27, 1979, Ser. No. 70,285

Int. Cl.³ E21B *33/138*

U.S. Cl. 166—294 **16 Claims**



1. A method of reducing the fluid conductivity of a conductive subterranean zone, which comprises:

introducing an aqueous fluid containing gel-forming amounts of water-soluble lignosulfonate and water-soluble silicate into said conductive zone and maintaining said aqueous fluid in said zone until said aqueous fluid is converted to a gel.

4,275,790

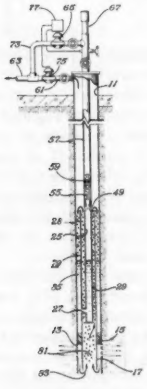
SURFACE CONTROLLED LIQUID REMOVAL METHOD AND SYSTEM FOR GAS PRODUCING WELLS

Bolling A. Abercrombie, Houston, Tex., assignor to McMurry-Hughes, Inc., Huntsville, Tex.

Filed Nov. 5, 1979, Ser. No. 91,035

Int. Cl.³ E21B *43/12*

U.S. Cl. 166—314 **5 Claims**



1. A method of removing accumulated liquid from a well that is producing liquid and gas, the well being of the type having a casing with perforations at a producing formation, the casing being connected at its top to a sales line for producing gas and having a string of tubing located therewithin, the method comprising:

connecting the top of the tubing to the sales line, the lower end of the tubing being in communication with the accumulated liquid;

opening the casing to the sales line, allowing the accumulated liquid to collect in the casing and the tubing as the gas is produced; then

closing both the tubing and the casing at the sales line, allowing pressure to build up in the casing, and forcing the accumulated liquid in the tubing upward; then

opening the tubing only to the sales line, allowing pressure in the casing to force the accumulated liquid in the tubing into the sales line; then

opening the casing also to the sales line to cause gas to again flow from the casing to the sales line.

3. In a well of the type having casing with perforations in a producing formation, the casing being connected at its top to a sales line for producing gas, an improved system for removing accumulated liquid from the well, comprising:

an open-ended standpipe of length substantially less than the depth of the well, mounted within the casing by a packer located above the perforations, defining a collection chamber between the standpipe and the casing above the packer for the accumulated liquid;

a string of tubing mounted in the casing, the tubing having a lower end located inside the standpipe that is closed to fluid flowing from the perforations up the standpipe, defining a flow path between the tubing and the standpipe for the fluid flowing from the perforations, the lower end of the tubing being in communication with the collection chamber by a passage, the top of the tubing being connected to the sales line;

a plunger located inside the tubing and reciprocal between a lower position adjacent the standpipe and an upper position at the top of the tubing; and

valve means for selectively opening and closing the casing and the tubing to the sales line.

4,275,791

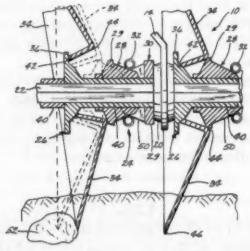
YIELDABLE DISC BLADE ASSEMBLY

Robert B. Rottinghaus, 4121 S. Canfield Rd., Jesup, Iowa 50648

Filed Jul. 27, 1979, Ser. No. 61,192

Int. Cl.³ A01B *61/00, 71/04*

U.S. Cl. 172—570 **6 Claims**



1. A yieldable disc blade assembly adapted for use on a rotatably mounted shaft attached to an implement frame, said disc blade assembly comprising:

a fixed hub attached to said shaft, said hub being axially and radially fixed with respect to said shaft;

a disc blade having a central opening larger than said shaft, such that the disc blade is movable radially with respect to said shaft, said disc blade having one surface in contact with said fixed hub;

means for radially positioning said disc blade with respect to said fixed hub;

a yieldable block disposed on said shaft, said yieldable block

being in contact with an opposite surface of said disc blade; and

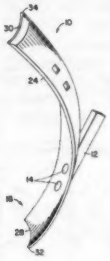
means for biasing said yieldable block axially in the direction of said disc blade said biasing means requiring a first greater force to move the yieldable block in a direction away from said disc blade and a second lesser force to continue movement away from said disc blade after movement progresses to a predetermined point.

4,275,792

SHOVEL WITH SOIL DIRECTING STRUCTURE

Thomas C. Jensen, and Terry L. Lowe, both of Ankeny, Iowa, assignors to Deere & Company, Moline, Ill.

Filed May 29, 1979, Ser. No. 43,115
Int. Cl.³ A01B *15/02*
U.S. Cl. 172—703 **27 Claims**



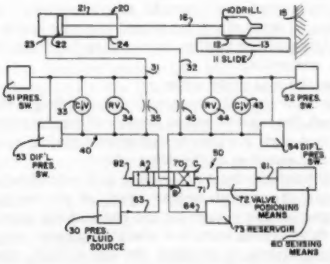
8. A shovel adapted for mounting on a standard and for moving forwardly through the soil for lifting and turning the same, the shovel comprising: an elongated member having upper and lower ends, a longitudinal axis, opposed longitudinal blunt edges, and a concave surface substantially along its entire length connecting the edges, said member curved forwardly about its axis so the ends and the concave surface extend generally in the forward direction thereby forming a concave soil-directing path extending substantially from the lower to the upper end, and wherein the lower end includes a cutting edge relatively more sharp than the blunt edges extending generally transversely to the forward direction between the edges.

4,275,793

AUTOMATIC CONTROL SYSTEM FOR ROCK DRILLS

George P. Schivley, Jr., Bridgeport, W. Va., and Peter L. Madonna, Dover, N.J., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Feb. 14, 1977, Ser. No. 768,096
Int. Cl.³ B23Q *5/033*; E21C *5/10*; F15B *11/15, 13/042*
U.S. Cl. 173—9 **10 Claims**



1. A control means for use in a drill feed system of the type having a driving means connected to receive pressurized fluid to move a drill, a pressurized fluid source, and a connecting means for delivering pressurized fluid from the fluid source to the driving means; said control means comprising:

a pressure means for measuring the pressure of the fluid delivered to the driving means to produce a signal indicating fluid pressure level;

a pressure differential means for measuring the flow of the fluid delivered to the driving means to produce a signal indicating fluid flow rate:

a sensing means responsive to the signals of the pressure means and pressure differential means for producing a signal indicating a preselected fluid pressure level and a preselected flow rate; and

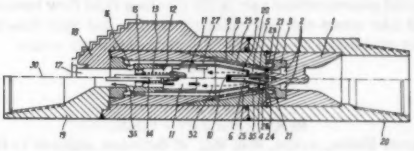
a flow means for controlling the direction of fluid flow to the driving means in response to the signal of the sensing means.

4,275,794

TOOL EQUIPPED WITH A PERCUSSIVE DEVICE

Mario Carbonaro, Brussels, Belgium, assignor to Compagnie Francaise des Petroles, Paris, France

Filed Jul. 31, 1978, Ser. No. 929,581
Claims priority, application France, Aug. 5, 1977, 77 24268
Int. Cl.³ E21B *4/14*
U.S. Cl. 173—135 **13 Claims**



1. A fluid operated percussive tool, comprising:

a first fluid flow path,

a second fluid flow path,

a fluid drive element operable to switch the flow path of the fluid,

a reciprocating hammer operable to be driven in one direction in response to fluid flow along said first flow path, and in a second direction in response to fluid flow along said second flow path, and,

a stop member for receiving a blow from said hammer moving in said one direction, and for transmitting said blow to a tool element,

wherein said fluid drive element comprises at least a generally conical internal surface of a first external piece and a generally conical external surface of an internal piece, said fluid element being operable to stabilize fluid flow along at least one of said surfaces, and wherein a flow separator is positioned between said surfaces and includes an inner wall which comprises a chamber for said hammer.

4,275,795

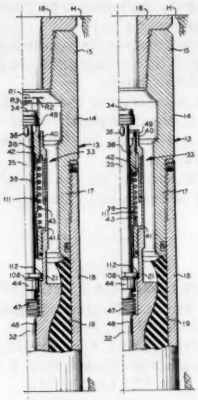
FLUID PRESSURE ACTUATED BY-PASS AND RELIEF VALVE

Herbert W. Beimgraben, and Paul A. Reinhardt, both of Houston, Tex., assignors to Baker International Corporation, Orange, Calif.

Filed Mar. 23, 1979, Ser. No. 23,202
Int. Cl.³ E21B *3/12*
U.S. Cl. 175—26 **17 Claims**

1. A valve apparatus having an inlet means exposed to a source of fluid under pressure and an outlet means connected to a fluid flow path, comprising: first pressure sensitive means responsive to the fluid under pressure at a first predetermined value for blocking fluid flow between said inlet means and said outlet means; second pressure sensitive means responsive to the fluid under pressure at a second predetermined value, greater than said first predetermined value, for establishing fluid flow between said inlet means and said outlet means; and third

pressure sensitive means responsive to the fluid under pressure at a third predetermined value, intermediate said first and



second predetermined values, for blocking fluid flow between said inlet means and said outlet means after said fluid flow has been established by said second pressure sensitive means.

4,275,796

ROCK DRILLING TOOL

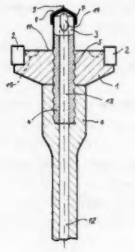
Werner Kleine, Achim, Fed. Rep. of Germany, assignor to Gebruder Heller Verwaltungsgesellschaft mit beschrankter Haftung, Achim-Uphusen, Fed. Rep. of Germany

Filed Feb. 15, 1979, Ser. No. 12,576

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1978, 2807156

Int. Cl.[3] E21C *13/08*

U.S. Cl. 175—385 **8 Claims**



1. A rock drilling tool comprising:

(a) a bracket means having a circular front face and an uninterrupted cylindrical circumferential surface, said circumferential surface forming a radially outermost surface of said bracket means;

(b) a central pilot shaft axially disposed in said bracket means and protruding forward therefrom;

(c) a tool shaft supporting said bracket means and said central pilot shaft;

(d) a first cutting member at the forward end of said central pilot shaft;

(e) a plurality of second cutting members disposed on said bracket means radially spaced outward from said first cutting member whereby an annular portion of said circular front face is disposed radially outside of said first and radially inside of said second cutting members for crushing the rock not engaged by said first and second cutting members;

(f) said second cutting members extending axially forward a predetermined distance beyond said circular front face and extending radially outward a second predetermined distance beyond said cylindrical circumferential surface;

(g) exhaust channel means for withdrawing fine drilled material from forward of said front face through said tool shaft; and

(h) said front face being substantially plane.

4,275,797

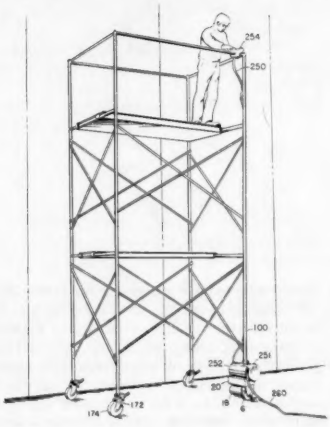
SCAFFOLDING POWER ATTACHMENT

Raymond R. Johnson, P.O. Box 964, Wenatchee, Wash. 98801

Filed Apr. 27, 1979, Ser. No. 33,908

Int. Cl.[3] B60K *7/00*; E04G *1/20*

U.S. Cl. 180—2 R **7 Claims**



1. A scaffolding power unit for attachment to scaffolding tower assemblages of the type commonly used for overhead finishing work in the installation of wiring, lighting fixtures, duct work and ceilings, which have detachable caster wheels so they may be rolled from place to place, the scaffolding unit comprising:

(a) a main frame;

(b) a pivotal attachment means connected to the main frame which pivotally attaches the scaffolding power unit to a single leg of the scaffolding tower assemblage;

(c) a drive wheel, rotatably attached to the main frame;

(d) a propelling means connected to the drive wheel which provides for linear motion of the scaffolding power unit and the attached scaffolding tower assemblage; and

(e) a clutch means, such that the propelling means may be disengaged from the drive wheel to rotate freely so the scaffolding tower may be manually rolled from place to place, comprising:

(1) also the said drive wheel;

(2) a drive wheel axle, concentrically attached to the drive wheel, having a threaded interior throughout and having one part of a tongue and groove mating system on the end attached to the drive wheel;

(3) a drive shaft, slidably attached to the drive wheel and having the complementary part of the tongue and groove mating system on the end slidably attached to the drive wheel, such that when the tongue and groove mating system is engaged the drive shaft, the drive wheel axle and the drive wheel rotate together;

(4) a turnscrew, threaded through the interior of the drive wheel axle, such that one end contacts the end of the drive shaft;

(5) a biasing spring; and

(6) a turnscrew handle, attached to the turnscrew, such that turning the turnscrew handle in one direction causes the end of the turnscrew to push against the end of the drive shaft, thereby separating the drive shaft and the drive wheel axle, such that the tongue and groove mating system is disengaged, permitting the drive wheel to rotate freely with respect to the drive shaft, while turning the turnscrew handle in the other direction releases the pressure of the turnscrew against the end of the drive shaft, thereby permitting the biasing spring to push the drive shaft and drive wheel axle back together, thereby reengaging the tongue and groove mating system.

4,275,798

POWER STEERING APPARATUS

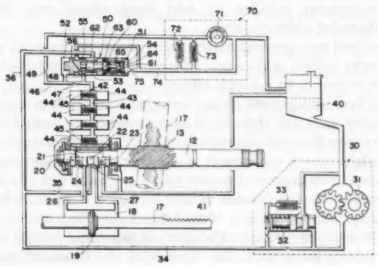
Masao Nishikawa, Tokyo; Toshihiko Aoyama, Saitama, and Yoichi Sato, Fujimi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 26, 1979, Ser. No. 60,877

Claims priority, application Japan, Jul. 31, 1978, 53-93377

Int. Cl.³ B62D *5/08*

U.S. Cl. 180—143 **10 Claims**



1. In a power steering apparatus for a vehicle, comprising:

a hydraulic source (30) for supplying hydraulic fluid to a supply line (34, 36, 136);

a hydraulic cylinder (18) having two chambers therein defined by a piston (19) arranged to provide hydraulic assistance for a steering linkage (12, 17);

a directional control valve (20) slidable so as to selectively connect one chamber in said hydraulic cylinder to said supply line and the other chamber in said hydraulic cylinder to a reservoir (40) in response to turning movement of a steering wheel (14) operatively connected to said steering linkage, and to provide communication between said supply line and said reservoir in the neutral position of said valve (20);

a plurality of hydraulic reaction chambers (42, 142) having respective plungers (44, 144) and first biasing means (45) normally urging said directional control valve toward said neutral position, said chambers (42, 142) communicating through a common passage (43, 143);

a reaction control valve (50, 150) connected between said supply line and said common passage, and movable toward the closed position thereof by hydraulic fluid pressure in a first chamber (52, 152) and normally urged toward the open position thereof by a second biasing means (51, 151) in a second chamber (54, 154), said first chamber being connected to an exhaust line (46, 146) communicating through a first orifice (47, 147) with said common passage; and

a vehicle speed sensor (70) connected to the downstream side of said exhaust line for discharging hydraulic fluid in proportion to vehicle speed;

the improvement comprising:

a hydraulic passage including a valve means (60, 160) provided between said supply line (34, 36, 136) and said second chamber (54, 154), said reaction control valve (50, 150) being further urged toward the open position thereof by hydraulic fluid pressure thus introduced into said second chamber (54, 154); and

said valve means (60, 160) being movable toward the open position thereof by hydraulic fluid pressure in a third chamber connected to said common passage (43, 143) and normally urged toward the closed position thereof by a third biasing means (61, 161) in a fourth chamber (64, 164).

4,275,799

WHEEL HUB AND HOMOKINETIC JOINT ASSEMBLY

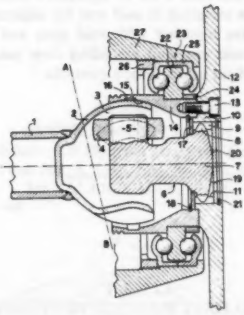
Pierre L. Guimbretiere, Neauphle le Chateau, France, assignor to Spicer Glaenzer, Poissy, France

Filed Apr. 26, 1979, Ser. No. 33,678

Claims priority, application France, Apr. 28, 1978, 78 12766; Apr. 3, 1979, 79 08301

Int. Cl.³ B60K *17/30*

U.S. Cl. 180—255 **17 Claims**



1. A structure for a wheel of a vehicle and comprising a hub for the wheel, a first homokinetic joint, a transmission shaft, a rolling bearing comprising first ring means and second ring means which are relatively rotatable, said second ring means providing means for fixing it to a hub supporting element of the vehicle which does not rotate with the transmission shaft, said first homokinetic joint comprising a tripod first element defining three trunnions, three part-spherical rollers respectively rotatively mounted on the trunnions, and a second element connected to rotate with the transmission shaft and defining three raceways in which raceways the rollers are respectively received, the first element being distinct from the hub, an auxiliary homokinetic coupling which interconnects the hub and the first element, a case which is rigid with the hub and defines a concave part-spherical bearing surface, means rigid with the second element and defining a convex part-spherical bearing surface which is complementary to and cooperates with the concave part-spherical bearing surface, and means axially fixing said first ring means of said rolling bearing between the hub and the case.

4,275,800

VEHICLE WITH VARIABLE HEIGHT CONTROL STATION

Stephen E. Batzel, 130 Vassar St., Reno, Nev. 89502

Filed Sep. 28, 1979, Ser. No. 79,952

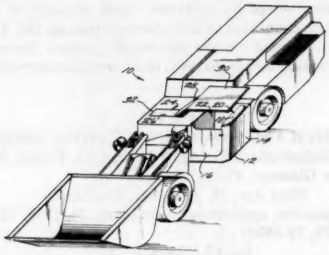
Int. Cl.³ B60K *26/02*; B62D *33/06*

U.S. Cl. 180—317 **17 Claims**

1. For a vehicle which includes an on-board operator's work station, at which there is a cab having side walls and an open top, the improvement comprising:

a generally horizontal cantilever arm having one end pivotally secured to the vehicle distally of the work station and having another end disposed adjacent the work station;

extensible/retractable support means for extending between the arm, intermediate said ends, and the vehicle for supporting said arm at an adjustable and fixable elevation relative to said vehicle about said one end;



an operator's seat and a set of operator's controls for the work station mounted to said arm for adjustable and fixable elevation together with said arm; and a cab roof secured to said arm and extending over said operator's seat and said set of operator's controls.

4,275,801

NOISE AND HEAT INSULATING STRUCTURAL COMPONENT

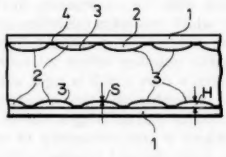
Oskar Bschorr, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Fed. Rep. of Germany

Filed Aug. 17, 1979, Ser. No. 67,219

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1978, 2838193

Int. Cl.³ E04B *1/88, 2/02;* E04C *2/54*

U.S. Cl. 181—290 **10 Claims**



1. A noise and heat insulating structural component, comprising two outer wall means spaced to form a hollow space therebetween, a plurality of auxiliary load buckling surface members which are domed when substantially free of a load and which buckle when subject to a load, said domed auxiliary load buckling surface members being located between said outer wall means, said auxiliary load buckling surface members enclosing a plurality of evacuated pockets each having a respective volume, said load buckling auxiliary surface members having a given wall thickness and a dome height corresponding substantially to 0.5 to 3.0 times said given wall thickness, whereby the so formed pockets form so-called Belleville type springs having a small spring constant relative to the load caused by the pressure difference between the pressure surrounding said pockets and the reduced pressure in said pockets.

4,275,802

MECHANICAL SHOCK ABSORBER

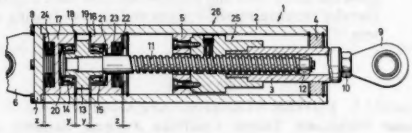
Fredrik W. de Groot, and Jörg D. Bernert, both of Zeven, Fed. Rep. of Germany, assignors to Liseg Kraftwerkstecknik GmbH & Co. KG, Fed. Rep. of Germany

Filed Apr. 12, 1979, Ser. No. 29,574

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1978, 2825499

Int. Cl.³ B60T *7/12*

U.S. Cl. 188—134 **11 Claims**



1. A shock absorber for attenuating a shock effect between a fixed point and a movable element comprising:

a casing;

a threaded element having a longitudinal axis and being mounted for limited axial movement within said casing;

a first engagement means being mounted for limited radial movement relative to said longitudinal axis of said threaded element; and

a second engagement means being mounted for axial movement within said casing relative to said threaded element in response to a shock effect;

said first engagement means being in normal contact engagement with the threads of said threaded element for converting the axial movement of said first engagement means into a rotary movement of the threaded element and said second engagement means being normally out of engagement with the threads of said threaded element, whereby upon the application of said shocking effect above a predetermined amount, the first engagement means moves radially away from the threads of the threaded member permitting axial movement of the second engagement means which abuts against the threads of said threaded element to block further rotational movement of the threaded element by becoming lockingly engaged with the threads of said threaded element while said shocking force is applied thereto.

4,275,803

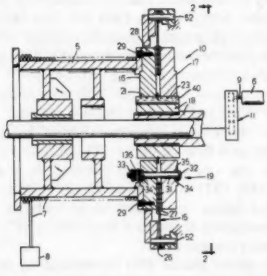
LOAD BRAKE

Gordon A. Putney, New Berlin, Wis., assignor to Harnischfeger Corporation, West Milwaukee, Wis.

Filed Oct. 1, 1979, Ser. No. 80,414

Int. Cl.³ B60T *7/12*

U.S. Cl. 188—134 **14 Claims**



7. A load brake of the type comprising a driver rotatable in opposite directions about an axis, a rotatable braking member which can rotate about said axis in said directions but tends to

be biased in one of said directions by a load connected therewith and which has a substantially axially facing surface, a cooperating braking element which is confined against rotation in said one direction and which has a substantially axially facing surface that is engageable by said surface on the rotatable braking member to frictionally oppose rotation of the rotatable braking member in said one direction, and a control member rotatable in said directions coaxially with said rotatable braking member and which is constrained to rotate in said one direction with the driver, and wherein said rotatable braking member, said control member and said cooperating braking element are arranged for axial movement relative to one another to provide for variation of the axial force under which said surfaces are engaged, said load brake being characterized by:

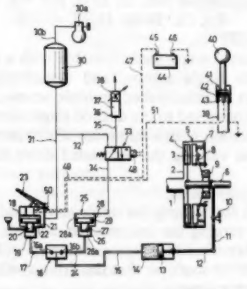
A. said braking element
  (1) being also confined against rotation in the opposite direction and
  (2) having another substantially axially facing surface which is opposite its first memtioned surface and which is engageable by the control member;
B. said braking member and said control member being at axially opposite sides of said braking element; and
C. a plurality of elongated link elements, each having at one of its ends a swiveling connection to said rotatable braking member and at its other end a swiveling connection to said control member, each link element having its connection with the rotatable braking member circumferentially offset from its connection with the control member so that the link element extends at an inclination to said axis, the direction of said offset being such that rotation of the rotatable braking member in said one direction relative to the control member so changes said inclination as to effect relative axial shifting between said members in the direction to engage them clampwise with said braking element.

4,275,804

CONTROLLING AND OPERATING DEVICE FOR FRICTION CLUTCHES FOR MOTOR VEHICLES

István Szarka, and János Urbantsok, both of Budapest, Hungary, assignors to Autólpari Kutató Intézet, Budapest, Hungary

Filed Dec. 28, 1978, Ser. No. 974,004
Claims priority, application Hungary, Dec. 30, 1978, AU 390
Int. Cl.[3] B60K *41/22*
U.S. Cl. 192—3.58 **7 Claims**



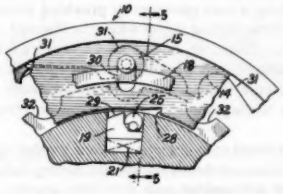
1. A controlling and operating device for motor-vehicle friction clutches arranged between the engine and a multistage, manually operated change-speed gear, including a gear-shift lever (**39**), the vehicle including a clutch (**5**) with an operating clutch pedal (**23**) and a hydraulic working cylinder (**14**), the device comprising, in combination; a manually operated electric switch (**43**) actuated together with said gear-shift lever; a limit switch (**50**) in series connection with said electric switch for selectively rendering the device inoperative; a release mechanism (**18**) operated by said clutch pedal; a hydropneumatic release unit (**25**) including a first hydraulic working cylinder (**26**) coupled to a second pneumatic working cylinder (**28**), wherein a pressure space (**26*a***) comprised in said first cylinder is connected via hydraulic duct elements (**15, 24**) to said cylinder of the clutch, and a pressure space (**28*a***) of said second cylinder is connected via an electro-pneumatic valve (**33**) to a source (**30**) of a pneumatic pressure medium through pipeline sections (**32, 34**); in its rest position said valve preventing communication in said pipeline sections between said source and said space of the second cylinder and providing communication in other pipeline sections (**34, 35**) that connect said space of the second cylinder with a retarding blow-off unit (**36, 36*a*, 36*b***) that communicates with the free atmosphere throttle (**38,60,69**), while when said valve is in its operative position it opens said first-named pipeline-section communication and prevents said other pipeline-sectiom communication; and an electrical circuit (**47, 49, 51**) that serially connects said electric switch and said limit switch between an electric power source (**44** to **46**) and an operating electromagnet (**48**) of said valve.

4,275,805

OVERRUNNING CLUTCH

John H. Crankshaw, 439 Shawnee Dr., Erie, Pa. 16505

Filed Jun. 5, 1978, Ser. No. 912,746
Int. Cl.[3] F16D *11/00, 41/08*
U.S. Cl. 192—46 **11 Claims**

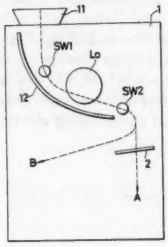


1. A clutch (**10**) having a drive member (**11**) and a driven member (**12**),
  cam surfaces (**31**) defining pockets in the said driven member (**12**),
  detent means (**15**),
  said detent means (**15**) being adapted to be received in said pockets,
  resilient means (**18,115**) supported by said detent means (**15**) and urging said detent means (**15**) into said pockets when said drive member (**11**) rotates relative to said driven member (**12**) in a first direction,
  ring means (**16**),
  said ring means (**16**) having an inwardly directed notch (**28**) thereon,
  pawl means (**19**) supported on said drive member (**11**) and radially movable relative thereto adapted to engage a side of said notch (**28**) on said ring means (**16**) when said drive member (**11**) rotates relative to said driven member (**12**) in the first direction,
  radially extending slots (**30**) in said ring means receive the ends of said detent means,
  said pawl means (**19**) engaging said notch once the drive member rotates in a second direction relative to said driven member (**12**) whereby said ring means moves said detent means along cam surfaces (**31**) moving said detent means (**15**) into engagement with said drive member (**11**),
  whereby said drive member (**11**) and/or driven member (**12**) are positively connected together.

4,275,806
COIN SORTING MACHINE

Akio Tanaka; Yoshihisa Nakajima, and Shinji Yokomori, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Jun. 6, 1978, Ser. No. 913,161
Claims priority, application Japan, Jun. 7, 1977, 52-66971
Int. Cl.[3] G07D 5/08
U.S. Cl. 194—100 A 1 Claim



1. A coin sorting machine in which a sorting coil for detecting the characteristics of a coin inserted into the machine is provided along a coin passageway provided therein, said coil producing a true sorting signal when the inserted coin is a true coin and not a false coin, but, in which, when a false coin is of the same material and thickness as, but of a diameter larger than, a true coin is detected, said coil produces two closely spaced true sorting signals, wherein the improvement comprises:

first and second coin detecting means located upstream and downstream, respectively, of said sorting coil for producing first and second coin detecting signals when an inserted coin is detected by said first and second coin detecting means, respectively;

said first and second coin detecting signals defining a sorting period during which a true coin sorting signal must occur in order to recognize a coin as a true coin;

first circuit means responsive to the occurrence of only one of said sorting signals during said sorting period for generating a true coin output signal;

second circuit means responsive to the occurrence of both of said sorting signals during said sorting period for inhibiting said first circuit means and thereby preventing the generation of said true coin output signal, whereby said false coin of said larger diameter is not recognized as a true coin;

a first flip-flop which receives a first sorting signal as a set input signal to produce a first output signal;

a second flip-flop which, when said first flip-flop is in set state, is set by a second sorting signal to produce a second output signal;

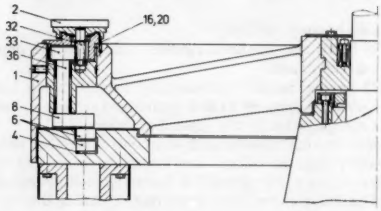
a third flip-flop which receives as a set input signal said first detection signal and receives as a reset input signal said second detection signal and applies a reset input signal to said first and second flip-flops when said third flip-flop is in a reset state; and

means for receiving the first and second output signals of said first and second flip-flops, respectively, and providing a true coin output signal indicating that said inserted coin is a true coin only when only said first and third flip-flops have been set during said coin sorting period.

4,275,807
SUPPORT FOR ROTATABLE PLATFORMS FOR BOTTLES

Hans-Werner Mohn, Kaarst; Rainer Buchholz, Dusseldorf; Egon Höveler, Haan, and Rudolf Zodrow, Dusseldorf, all of Fed. Rep. of Germany, assignors to Jagenberg-Werke AG, Dusseldorf, Fed. Rep. of Germany

Filed Jul. 23, 1979, Ser. No. 59,862
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1978, 2832778
Int. Cl.[3] B65C 9/04
U.S. Cl. 198—344 5 Claims



1. In a support having a plurality of circularly arranged rotatable platforms for bottles and a drive mechanism having a plane stationary cam plate and sensing elements for each platform in contact with the cam plate, the improvement wherein the drive mechanism further comprises for each platform: a lever arm coupled to the sensing elements and pivoted thereby, a platform drive shaft having the platform mounted thereon and having a pinion thereon, a gear in engagement with the pinion and driven by the lever arm and means mounting the platform, lever arm, drive shaft and gear to permit 180° angular displacement of the lever arm and gear with respect to the pinion so that clockwise and counter-clockwise rotation of the platforms is possible.

4,275,808
INTERCHANGEABLE VOLUMETRIC SCREW FEEDER

Kenneth W. Bullivant, Millville, N.J., and Hermann Schreier, Lenzburg, Switzerland, assignors to K-Tron International Inc., Scottsdale, Ariz.

Continuation of Ser. No. 811,105, Jun. 29, 1977, abandoned.
This application Feb. 27, 1979, Ser. No. 15,698
Int. Cl.[3] B65G 33/18, 47/18
U.S. Cl. 198—533 6 Claims

1. A volumetric screw feeder useable with a multiplicity of interchangeable single screws, and a multiplicity of interchangeable sets of intermeshed multiple screws, which screw feeder can be converted to the desired single screw or multiple screw configuration with a minimum of disassembly and reassembly without varying the associated drive mechanism, including:

only one motor means;

a drive shaft for turning the single screw and a set of drive shafts for turning the intermeshed multiple screws;

only one drive means for interconnecting said motor means and said drive shafts so that the drive shafts are powered by the motor means;

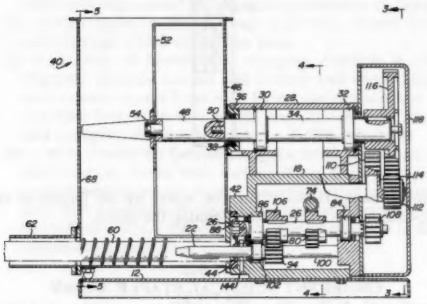
said single screw drive shaft and said multiple screw drive shafts being positionable closely adjacent and one above the other so that whichever screw or set of screws is attached to the drive shafts such screw or set of screws is located in the same position on the screw feeder;

the uppermost of said drive shafts being detachable when said lowermost drive shafts are being used;

said screws being adapted to be attachable to and detachable from said drive shafts;

a plurality of interchangeable feeder-hopper means for use with either a single screw or a set of multiple screws;

each feeder-hopper means having a trough adapted for receiving its associated screw or screws;



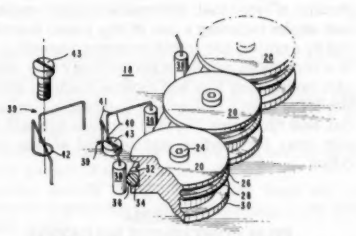
whereby said screw feeder can be used with either a single screw or a set of intermeshed multiple screws by attaching only the selected screw or screws and feeder-hopper means to the screw feeder.

4,275,809

CARD CONVEYOR WITH ROPE BELT DRIVE

Francis J. Garvey, Newfield, and William F. Buckminster, Vineland, both of N.J., assignors to Garvey Corporation, Blue Anchor, N.J.

Filed Jul. 30, 1979, Ser. No. 61,867
Int. Cl.³ B65G *29/00, 13/06*
U.S. Cl. 198—624 **2 Claims**



1. In a conveyor system for cards and the like, the combination comprising

a planar frame surface;

a plurality of conveyor rollers rotatably attached to said surface, the conveyor rollers aligned in two parallel spaced rows;

each conveyor roller having an axis of rotation perpendicular to the frame surface;

two endless belts, each extending tangent to each conveyor roller in a respective row;

means for driving said belts in the same direction;

each of the conveyor rollers having an upper circumferential groove to receive an edge of a card being conveyed and a lower circumferential groove for receiving the respective endless belt;

a plurality of pressure rollers suspended above the frame surface, each roller being rotatable around an axis perpendicular to the surface;

there being one pressure roller adjacent each conveyor roller;

each of the pressure rollers having a smooth cylindrical surface;

means for biasing each pressure roller toward its respective conveyor roller with sufficient force to preclude belt slippage;

said biasing means including an independent support for each respective pressure roller, each support being attached to said frame surface;

at least a portion of said support being resilient;

each pair of adjacent supports being fastened to said frame surface at a single point;

each pair of adjacent supports being formed from a single piece of spring wire defining

an arcuate horseshoe-shaped portion attached to the frame surface,

a pair of uprights extending from either end of the arcuate portion, and

a horizontal arm extending from the upper end of each upright;

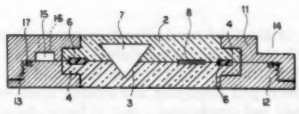
a pressure roller being rotatably supported at the opposite end of each arm.

4,275,810

PACKAGE FOR DIAMONDS AND OTHER PRECIOUS STONES

Othmar E. Waldmeier, Heuberg 12, 4001 Basel, Switzerland

Filed Aug. 2, 1979, Ser. No. 63,167
Claims priority, application Switzerland, Jun. 1, 1979, 5153/79
Int. Cl.³ B65D *25/54, 61/00;* A45C *11/16*
U.S. Cl. 206—45.34 **13 Claims**



1. A secure package for storing a precious stone, comprising:

a two-part transparent core formed from a pair of disks defining between them a chamber for receiving a precious stone and a space for receiving a data carrier identifying said stone;

an annular body of a material difficult to destroy surrounding said core and holding the parts thereof together, said body being formed from a pair of hard-metal rings secured inseparably together along a contact surface and holding said disks against one another, one of said rings having an annular groove at said contact surface; and

sound-recording material received in said groove and provided with coded information relating to the stone in said chamber.

4,275,811

RECEPTACLE FOR CONTAINING AND DISPLAYING FOOD PRODUCTS

Alan H. Miller, Hickory, N.C., assignor to Cellu Products Company, Patterson, N.C.

Continuation-in-part of Ser. No. 69,074, Aug. 23, 1979, abandoned, which is a continuation of Ser. No. 885,622, Mar. 13, 1978, abandoned. This application Nov. 23, 1979, Ser. No. 96,797
Int. Cl.³ B65D *81/26, 81/22*
U.S. Cl. 206—204 **17 Claims**

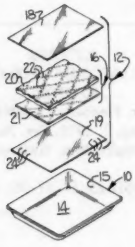
1. A receptacle for containing and displaying food products which tend to exude liquids, such as meat and poultry, and characterized by the ability to separate and maintain the exuded liquids from the food product to thereby minimize contamination of the food product and improve the appearance and shelf-life thereof, and comprising

a food product supporting member having a wall, and

an absorbent pad overlying and resting upon said wall, said

pad comprising a mat of liquid absorbent material, an imperforate, liquid impermeable upper sheet overlying and covering said mat, and a bottom sheet of substantially liquid impermeable material underlying said mat so as to be disposed between said mat and said supporting member wall, the peripheral edges of said upper and bottom sheets being sealed together to enclose said mat of absorbent material therebetween, and said bottom sheet including a plurality of openings which are sized to permit passage of a liquid from said supporting member wall into said mat while substantially precluding reverse flow of the liquid and any associated bacteria back to the food product, and such that the liquid passes around the edges of the pad and into said mat and is confined by said pad out of contact with the food product.

8. A receptacle for containing and displaying food products which tend to exude liquids, such as meat and poultry, and characterized by the ability to separate and maintain the exuded liquids from the food product to thereby minimize contamination of the food product and improve the appearance and shelf-life thereof, and comprising



a supporting tray having a bottom wall, and

an absorbent pad overlying and resting upon said bottom wall, said pad comprising a mat of liquid absorbent material, an imperforate, liquid impermeable upper sheet overlying and covering said mat, and a bottom sheet of substantially liquid impermeable material underlying said mat so as to be disposed between said mat and said tray bottom wall, the peripheral edges of said upper and bottom sheets being sealed together to enclose said mat of absorbent material therebetween, and said bottom sheet including a plurality of openings which are sized to permit passage of a liquid from said tray bottom wall into said mat while substantially precluding reverse flow of the liquid and any associated bacteria back to the food product, and such that the liquid passes around the edges of the pad and into said mat and is confined by said pad out of contact with the food product.

4,275,812

SURGICAL GLOVE PACKAGE AND DONNING METHOD

Mark P. Poncy; George W. Poncy, and Richard P. Poncy, all of 3660 E. Indus. Way, Riviera Beach, Fla. 33404

Continuation of Ser. No. 618,336, Oct. 1, 1975, abandoned, and a continuation-in-part of Ser. No. 600,893, Aug. 1, 1975, Pat. No. 4,002,276. This application May 16, 1977, Ser. No. 797,384

Int. Cl.³ B65D *85/18*

U.S. Cl. 206—278 **11 Claims**

1. A surgical glove package comprising a ring and a glove made of elastomeric material having a sterile outer surface and having the cuff portion thereof stretched around the edge of said ring to the outside surface of said ring, said ring having an axial dimension shorter than the length of said glove from the cuff thereof to the fingertips thereof, said glove being extendable to an unfolded condition, said ring being unattached to any inflexible apparatus surrounding the outside surface of said glove when said glove is extended to said unfolded condition, said package including means enabling the cuff of said glove to be released from said ring onto the wrist of an inserted hand by

manual manipulation of the cuff solely by the fingers of the opposite hand of the person donning the glove.

4,275,813

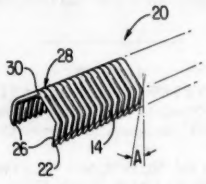
COHERENT SURGICAL STAPLE ARRAY

Douglas G. Noiles, New Caanan, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Jun. 4, 1979, Ser. No. 45,289

Int. Cl.³ B21D *53/46*

U.S. Cl. 206—339 **23 Claims**



1. A coherent surgical-staple stack comprising:

a plurality of individual, deformable surgical staples, each of said staples including a pair of legs joined together at one end by a crown, said staples arranged one next to the other in a contiguous parallel array with any two adjacent staples having their legs and crowns touching; and

a film made from a biologically compatible non-toxic material, said film being disposed between adjacent staples in said array for bonding said adjacent staples one to the other.

4,275,814

FILM CONTAINING MAGAZINE

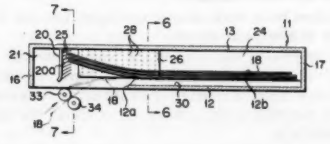
Hiroshi Kageyama, Utsunomiya, and Tsuyoshi Saito, Otawara, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Aug. 20, 1979, Ser. No. 68,007

Claims priority, application Japan, Aug. 25, 1978, 53-103700

Int. Cl.³ G03B *41/16*; A61B *6/00*; B65H *3/00*; B65D *85/30*

U.S. Cl. 206—455 **12 Claims**



1. An elongated flat film containing magazine for containing a stack of sheet films used for an X-ray photographing machine which includes a frame on which said magazine is supported and tiltable to orient said magazine in various positions includ-

ing upright horizontal, titled, and reversed or upside-down horizontal positions, said magazine comprising:

(a) top, bottom and side walls extending along a longitudinal axis of the magazine, and front and back walls disposed crosswise of the longitudinal axis of the magazine, said walls defining a space for containing a number of films;

(b) an opening formed in said top wall close to said front wall through which sheet films pass;

(c) a plurality of flexible film engaging elements in said magazine directed toward said bottom wall and inclined with respect to said front wall facing one of the edges of the sheet films contained in said magazine so as to allow said engaging elements to engage said film edge; and

(d) a wide depression formed along the longitudinal axis of said magazine on the inner surface of said top wall to said opening and facing the sheet films contained in said magazine, said depression minimizing engagement between the sheet films and said top wall when said magazine is in said upside-down horizontal position.

4,275,815

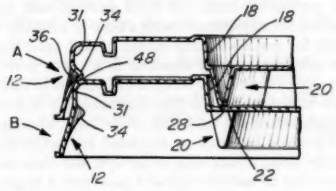
LID

Paul Davis, Swampscott, Mass., assignor to Sweetheart Plastics, Inc., Wilmington, Mass.

Continuation of Ser. No. 688,987, May 24, 1976, abandoned, which is a continuation of Ser. No. 372,980, Jun. 25, 1973, abandoned. This application Jul. 2, 1979, Ser. No. 53,993

Int. Cl.³ B65D *21/02, 43/00*

U.S. Cl. 206—508 **6 Claims**



1. A stack of disposable plastic circular container lids having a first disposable, plastic circular lid comprising:

a generally flat circular closure wall and an integral peripheral skirt extending away from the closure wall at a rim portion of said lid,

and a stacking facility in the closure wall within an outer annular portion of said closure wall,

said annular portion being divided into inner and outer sections by a generally U-shaped encircling recess defined by said portion,

said inner section having radially extending stiffening flutes and said outer section defining a container rim seat,

said recess comprising means to prevent adjacent lids from sticking together when one rim portion may be forced toward another rim portion,

said stacking facility including a circular recess in the closure wall coaxial therewith, said recess having a bottom wall and surrounding circular side wall, said side wall extending away from the closure wall with said bottom wall being spaced from the plane of the closure wall,

a plurality of feet extending from the bottom wall adjacent the side wall and extending away from the bottom wall, said feet being arranged in a substantially circular array, each of said feet having an outer, outwardly facing side wall of arcuate configuration conforming to a section of said circular side wall and defining a lower arcuate stacking edge,

said lower arcuate stacking edges of said feet occupying approximately one-half of the circle defined by said feet,

said feet tapering in a direction away from the bottom wall and being engageable with the bottom wall of an adjacent lid in a stack of substantially identical lids, said feet lying within and closely adjacent the recess side wall of said adjacent lid and said feet comprising means to prevent the lids from jamming under axially applied load and from slipping sideways with respect to each other so that a stack of such lids has great lateral stability,

and a second lid corresponding to and overlying said first lid but having a second plurality of feet comprising a different number than said first lid.

4,275,816

COMPACT WALL MOUNTED CUE RACK

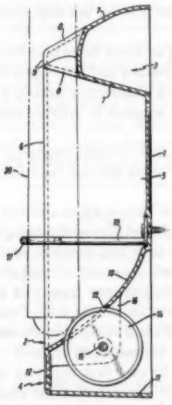
John B. Denton, Carlisle House, Knutsford Rd, Lindow End, Mobberley, Knutsford, Cheshire; John G. Dale, Rocklands, Bollin Hill, Wilmslow, Cheshire, and Norman L. Rimmer, Old Golf House, Whaley Bridge, Stockport, Cheshire, all of England

Filed Oct. 16, 1978, Ser. No. 951,740

Claims priority, application United Kingdom, Oct. 25, 1977, 44275/77

Int. Cl.³ A47F *7/00*

U.S. Cl. 211—68 **8 Claims**



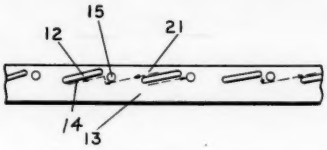
1. A rack for an elongated implement such as a cue, said rack having a front side thereto and comprising a base member and a pair of side supports above said base member, said base member and said side supports being arranged for supporting said implement in generally upright disposition with the bottom end of the implement abutting the base member and the implement in engagement with said side supports, said side supports comprising front and back support members adapted respectively to engage and support front and back sides only of the implement and said back support member being above said front support member, and said base member having a surface thereon which is freely movable towards and away from said front side of the rack with the bottom end of the implement in engagement therewith, thereby to facilitate movement of said implement into and out of the supported position thereof on movement of said implement respectively rearwardly and forwardly into and out of engagement with said upper back support member.

4,275,817

SAFETY CLOSURE AND CONTAINER COMBINATION

John S. Patton, Richmond, Va., assignor to Ethyl Corporation, Baton Rouge, La.

Filed Oct. 11, 1979, Ser. No. 83,978
Int. Cl.[3] B65D 55/02
U.S. Cl. 215—217 8 Claims



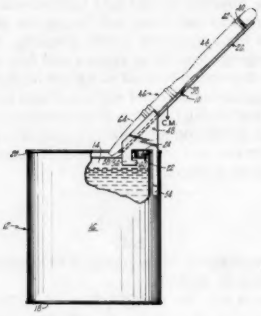
1. In combination, a safety closure and a container,
said container having a neck comprising a first rim terminating in a first open end,
spaced relatively rigid first lugs fixed to said first rim,
said first lugs each having a first end and a second end and a generally straight relatively flat first ramp surface on the side of said first lugs remote from said first open end and a second ramp surface on the side thereof opposite said first surface,
said first lugs being inclined from said first end toward said second end and toward said first open end,
said closure having a second rim having a closed end and a second open end adapted to receive said first rim of said container,
a resilient liner in said closure engaging said closed end, spaced relatively rigid second lugs fixed to said second rim,
said second lugs each having a first end and a second end and a generally straight relatively flat third ramp surface inclined from said first end toward said second end and toward said second open end of said rim on the sides of each said second lug remote from said second open end
and a fourth ramp surface on the side of each of said second lugs opposite said third ramp surface on the side thereof remote from said second open end,
stops fixed relative to said first lugs and adjacent said first end thereof and on the side of a line passing through said first ramp surface from said first end to said second end of said first lugs, remote from said first open end, and above a line passing through the third ramp surface,
whereby, said closure and said container may be telescoped with one another bringing said fourth ramp surfaces into engagement with said second ramp surfaces and upon a relative rotation of said closure and said container in a first direction moving said second lugs past said stop thereby compressing said liner and bringing said third ramp surfaces into engagement with said first ramp surfaces,
and bringing said second ends of said second lugs into engagement with said stops holding said closure and said container against relative rotation in a second direction,
and upon movement of said closure toward said container compressing said liner moving said second end of said second lugs back past said stops allowing said closure and container to be rotated relative to one another in said second direction removing said closure from said container.

4,275,818

PAINT BRUSH HOLDER AND WIPER

Robert F. Church, Windsor Locks, Conn., assignor to The Paint Brush Holder Company, Farmington, Conn.

Continuation-in-part of Ser. No. 28,998, Apr. 11, 1979, abandoned. This application Jan. 10, 1980, Ser. No. 110,837
Int. Cl.[3] A46B 17/02
U.S. Cl. 220—90 15 Claims



1. A paint brush holder comprising:
a base having a front surface, a back surface, a bottom edge, a top edge, a first side and a second side;
a holder pin disposed within the base proximate the top edge and projecting from the front surface, said holder pin adapted for engagement with a hole in a handle of a paint brush for restraining movement of said paint brush;
a first side plate fixedly attached to a lower portion of the first side of the base wherein a top portion of said first side plate extends above the front surface and a bottom portion extends below the back side of the base wherein the bottom portion includes an extended leg projecting downwardly along a back edge of the first side plate for engagement with an outside wall of a paint can, a finger projecting downwardly along a front edge of the first side plate in a substantially parallel spaced apart relationship with the extended leg, a substantially horizontal section disposed between the finger and the extended leg and a protrusion extending from the finger toward the extended leg wherein the protrusion, the horizontal surface, the finger and a portion of the extended leg form a cavity adapted for engaging the rim of a paint can for securing the holder to the paint can; and
a second side plate substantially identical to the first side plate fixedly attached to a lower portion of the second side of the base wherein a top portion of said side plate extends above the front surface of the base and cooperates with the top portion of the first side plate and the front surface of the base to define a channel therebetween adapted for inhibiting lateral motion of a paint brush attached to the holder.

4,275,819

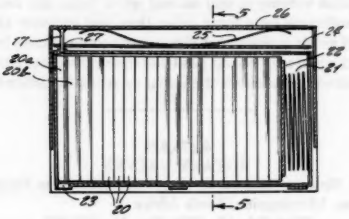
TWENTY CIGARETTE DISPENSER

Sergio J. Perez, 311 W. 97th St., (Apt. 3E), New York, N.Y. 10025

Filed Jul. 19, 1979, Ser. No. 59,044
Int. Cl.[3] A24F 15/04
U.S. Cl. 221—186 3 Claims

1. A straight line twenty cigarette dispenser, comprising in combination; a frame for placement upon a top of an automobile dashboard, and a cigarette case slid into said frame; said case comprising a flat box having a pivoted door on top; said case holding therein a single row of twenty cigarettes, and said frame comprising a flat rectangular plate and a channel on the top side of said plate, the channel extends along three edges of

said top side; a pressure plate inside an intermediate leg of said channel, a compression spring between said pressure plate and a rear wall of said channel intermediate leg urging said pressure plate against said case when slid in said channel; a forwardly extending push rod on said channel rear wall passing through a hole in said pressure plate and through a hole in a rear wall of said case.

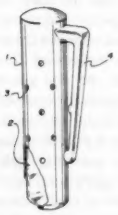


4,275,820

PERSONAL REPELLENT DEVICE

J. Paul LeBlond, Burnaby, Canada, assignor to J. W. Small, Austin, Tex.

Continuation of Ser. No. 875,190, Feb. 3, 1978, abandoned. This application Dec. 19, 1979, Ser. No. 105,742
Claims priority, application Canada, Dec. 16, 1977, 293259
Int. Cl.³ B65D *47/10*
U.S. Cl. 222—3 **10 Claims**



1. A personal assault deterrent device comprising:

a capsule formed of a single thickness of plastic material, said capsule having a free and uncovered outer surface and an inner surface;

a rupturable sealed glass ampoule positioned within said capsule, said ampoule containing therein a volatile composition of a nature adapted to deter and repel a potential assailant, said ampoule having an outer surface in contact with said inner surface of said capsule;

said capsule having perforations extending entirely through said single thickness of plastic material, from said free and uncovered outer surface thereof to said inner surface thereof; and

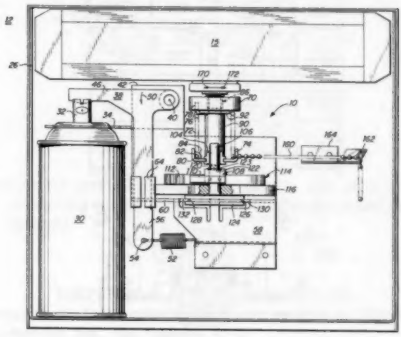
said capsule being sufficiently rigid to resist substantial deformation during normal handling, but said capsule being sufficiently deformable such that forceful manual pressure applied to said capsule will cause deformation thereof and will cause said ampoule to rupture, whereby said volatile composition will be dispersed through said perforations.

4,275,821

DRIVE SYSTEM AND FLUID DISPENSER UNIT UTILIZING SAME

Joseph P. Lanno, 60 Woodcliff Dr., Waltham, Mass. 02154, and Fred M. Finnemore, 76 Park St., North Reading, Mass. 01864

Filed Sep. 17, 1979, Ser. No. 75,951
Int. Cl.³ B67D *5/08*
U.S. Cl. 222—61 **13 Claims**



1. A mechanical drive system for providing a maximum limit on the magnitude of unidirectional output motion in response to reciprocating input motion comprising:

an output member moveable in a first direction;

a unidirectional drive for driving said output member in said first direction;

limiter means for limiting the motion of said unidirectional drive in said first direction to define a limit position; and

an override drive mechanism responsive to said reciprocating input motion occurring in one direction to drive said unidirectional drive to a rest position and to said reciprocating input motion ocurring in the opposite direction to drive said unidirectional drive in said first direction from said rest postion no farther than said limit position and absorbing input motion beyond said limit position.

4,275,822

APPARATUS FOR METERING AT LEAST TWO REACTION COMPONENTS INTO A MIXING CHAMBER

Richard Juffa, Cologne, and Heinrich Boden, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 11, 1979, Ser. No. 2,774
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1978, 2805946
Int. Cl.³ B67D *5/08*; G06F *15/46*
U.S. Cl. 222—63 **3 Claims**

1. An apparatus for metering at least two flowable reaction components in a preselected ratio into a mixing chamber comprising:

(A) a metering unit for each component, each metering unit comprising:

(i) a metering piston and a cylinder,

(ii) a feed pipe leading from a storage container into said cylinder,

(iii) a delivery pipe leading from said cylinder to said mixing chamber, and

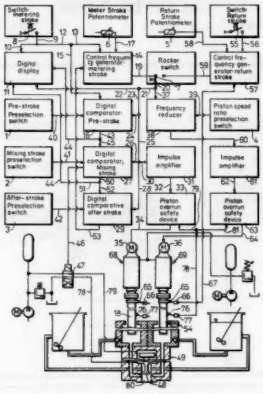
(iv) a drive unit in the form of an electro-hydraulic linear amplifier comprising a stepping motor for a control mechanism which is coupled to a hydraulic piston and cylinder, wherein said drive unit is capable of driving said metering piston, and

(B) control electronics for controlling said metering units, said control electronics comprising:

(i) at least one adjustable control frequency generator for

generating signals to be fed to said electrohydraulic linear amplifiers to control the movement of said metering pistons,

(ii) a first means of conducting said signals to at least one of said electro-hydraulic linear amplifier, and



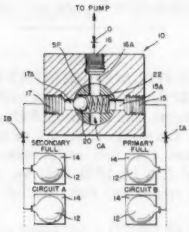
(iii) a second means for conducting said signals to all other electrohydraulic linear amplifiers via an adjustable frequency reducer.

4,275,823

AUTOMATIC CHANGE-OVER SYSTEM FOR LIQUID DISPENSING SYSTEM

William S. Credle, Jr., Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Jul. 27, 1979, Ser. No. 61,254
Int. Cl.³ B67D *5/34*
U.S. Cl. 222—94 **8 Claims**



1. In an automatic change-over device for a liquid dispensing system including, first and second sets of at least one collapsible bag for containing a liquid to be dispensed, each of said collapsible bags having a first volume when full and deflating to a second volume when empty, and pump means for drawing said liquid out of said first or second sets of collapsible bags when in circuit with said first or second sets, respectively, the improvement comprising:

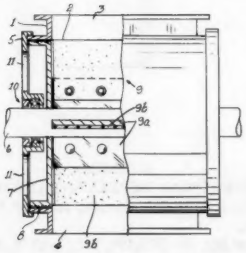
a change-over valve means in circuit between said first and second sets of bags and said pump means for providing selective communication therebetween, said change-over valve means including a single pressure sensitive check-valve which is normally closed for selectively providing an obstruction between said second set of bags and said pump means in an initial position and for selectively providing an obstruction between said first set of bags and said pump means in a second position, said single pressure sensitive check-valve means being opened in said initial position in response to a pressure change created by said second volume of said first set of bags, said single pressure sensitive check-valve means being opened in said second position in response to a pressure change created by said second volume in said second set of bags, and means for transferring by a force other than said pressure changes, said single pressure sensitive check-valve means between said initial and second positions to selectively provide said obstruction in either the initial or second positions.

4,275,824

ROTARY VALVES

John W. Bourne, Sandton, South Africa, assignor to Joyce Anne Bourne, Morningside, South Africa

Filed Feb. 17, 1978, Ser. No. 879,947
Claims priority, application South Africa, Feb. 17, 1977, 77/0956
Int. Cl.³ G01F *11/24*
U.S. Cl. 222—148 **2 Claims**



1. A rotary type valve of the type having a housing with a bore, passages communicating with the bore and adapted to be coupled to respective zones of differing fluid pressure, a rotor which is a snug fit within the bore, the rotor defining an axial drive shaft, a pair of spaced end plates on the shaft and a series of radial vanes disposed between the end plates, wherein: in the provision of material deflecting formations associated with peripheral surfaces of the end plates, the formations being adapted to urge material in the zone of such peripheral surfaces inwardly towards the zone intermediate the end plates upon rotation of the rotor in a predetermined direction, the deflecting formations are a generally helically wound thread or groove disposed in the peripheral surface of each end plate, the pitch of the threads being such that material in the threads is directed inwardly upon rotation of the rotor in a predetermined direction.

4,275,825

CLAMP-ON TUBE HOLDER AND METHOD

Patrick D. King, Rantoul, and Gary R. Folk, Urbana, both of Ill., assignors to Flo-Con Systems, Inc., Champaign, Ill.

Filed Oct. 29, 1979, Ser. No. 89,615
Int. Cl.³ B22D *41/08*
U.S. Cl. 222—590 **7 Claims**

4. A clamp-on tube holder for holding a tube to a gate nozzle of a molten metal pouring ladle comprising, in combination,

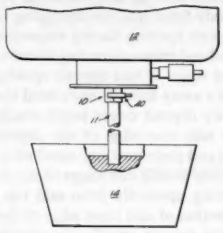
a slotted tube holder band,

a toggle assembly biasing said band, whereby actuation of the toggle will press fit the band against and onto the lower portion of the nozzle,

socket means on the end of the toggle for removably receiving a handle, and

yoke engaging means in substantially diametrically opposed locations at the lower portion of said band whereby a yoke

may engage the yoke engaging means to swing the clamp-on tube holder into position beneath a ladle and resist



rotation when a handle is positioned in the socket means and actuates the toggle.

4,275,826

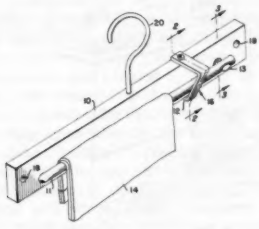
PANTS RACK

Roy W. Lessard, 2Greenbriar Cir., Hagerstown, Md. 21740

Filed Feb. 13, 1979, Ser. No. 11,958

Int. Cl.³ A47F 7/16; A47J 51/14

U.S. Cl. 223—96 **2 Claims**



1. A longitudinal member for holding a flexible material attached at one end to a base support member by a hinge pin and supported thereon to rotate in a plane substantially parallel to said base support wherein said base support member includes a wedge type bracket at a location near said hinge pin to cause said longitudinal member upon being rotated downwardly by the weight of said flexible material hanging thereon to simultaneously move inwards towards the base support and thereby wedge said material between itself and said base support.

4,275,827

ROLLED MATERIAL GUIDE AND CUTTER

Branham F. Cole, 2345 Griffith Park Blvd., Apt. 3, Los Angeles, Calif. 90039

Filed Aug. 22, 1979, Ser. No. 68,815

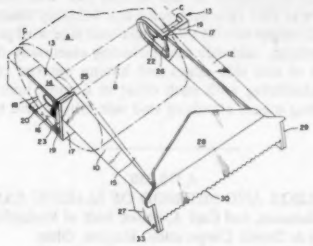
Int. Cl.³ B26F 3/02

U.S. Cl. 225—77 **10 Claims**

1. A rolled material guide and cutter attachable to a pre-existing rolled material holder, comprising:

a U-shaped frame including attachment means for attaching said guide and cutter to said pre-existing rolled material holder;

cover means pivotally attached to said frame, said cover means in conjunction with said frame forming a channel through which a rolled material is guided; and



means for providing a tortuous path in said channel for preventing lateral slippage and entanglement of said rolled material.

4,275,828

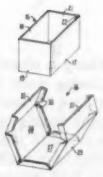
DISPENSING BOX CONSTRUCTION

Samuel M. De Franco, El Cerrito, Calif., assignor to Willamette Industries, Inc., San Leandro, Calif.

Filed Aug. 13, 1979, Ser. No. 66,178

Int. Cl.³ B65D 5/32, 5/48

U.S. Cl. 229—23 R **3 Claims**



1. A box comprising:

a unitary, integral tube which includes a first rectangular side wall panel having first and second end edges, a first end wall panel having first and second end edges with said first end edge of said first side wall panel being foldably and integrally connected to said first end edge of said first end wall panel, a second side wall panel having first and second end edges with a first end edge of said second side wall panel being foldably and integrally connected to said second end edge of said first end wall panel, a second end wall panel having first and second end edges with said first end edge of said second end wall panel being foldably and integrally connected to said second end edge of said second side wall panel, and a tab foldably and integrally connected to said second end edge of said second end wall panel and being attached to said first end edge of said second side wall panel to form a rectangular tube having both ends thereof open, and

a container containment portion which includes a first rectangular top panel having first and second end edges and first and second side edges, a first rectangular side wall having first and second end edges and first and second side edges with said side wall first end edge being integrally and foldably connected to said first top panel first end edge, a rectangular bottom panel having first and second end edges and first and second side edges with said bottom panel first end edge being integrally and foldably connected to said side wall second end edge, a second rectangular side wall having first and second end edges and first and second side edges with said side wall first end edge being foldably and integrally connected to said bottom

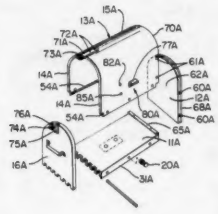
second end edge, a second rectangular top panel having first and second end edges and first and second side edges with said second panel first end edge being integrally and foldably connected to said second side wall second end edge, and side tabs integrally and foldably connected to the side edges of said top panels, said side wall panels and said bottom, said side tabs covering essentially the entire length of said side edges and having mitered end edges and interfitting with each other in a miter joint fit with attaching means attaching said side tabs to said tube panels.

4,275,829

MAILBOX AND METHOD OF MAKING SAME

Joseph S. Johnson, and Carl A. Stiles, both of Springfield, Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Nov. 15, 1979, Ser. No. 94,420
Int. Cl.³ A47G 29/12
U.S. Cl. 232—17 **9 Claims**



1. In a mailbox comprising a plurality of enclosing walls, means fastening said enclosing walls together, and a readily opened and closed access door for said mailbox; the improvement wherein said fastening means comprises a plurality of shear pins each having a strength which is substantially less than the strength of said enclosing walls and door so that upon subjecting said mailbox to high impact loads said shear pins shear resulting in disassembly of said mailbox while keeping said enclosing walls and door substantially intact; an additional shear pin hingedly fastening said access door to at least one of said enclosing walls so that upon subjecting said access door to high impact loads the shear pin hingedly fastening same also shears, resulting in the door falling away from said one wall while remaining substantially intact; said enclosing walls, door, and shear pins being made of a synthetic plastic polymeric material; said enclosing walls comprising a bottom wall, a rear wall, and a U-shaped wall fastened over said bottom wall and around said rear wall and door; said bottom wall having a pair of downwardly depending flanges extending from its opposite said edges, each of said flanges having an inclined surface which is inclined upwardly toward the center of said bottom wall, said U-shaped wall being provided with an integral flange at each of its lower edges, each of said flanges having an inside surface which engages said upwardly inclined surface to provide improved weatherproofing for the mailbox.

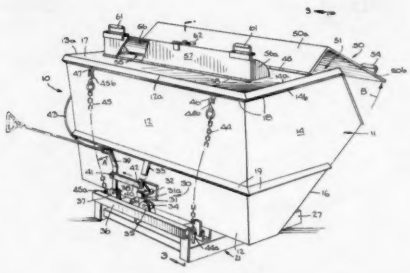
4,275,830

SECURITY SCRAP STORAGE CONTAINER OR BIN

Richard J. McDonald, 17A Jayne Ave., Melville, N.Y. 11747

Filed Nov. 9, 1979, Ser. No. 93,148
Int. Cl.³ B65F 1/00
U.S. Cl. 232—43.1 **5 Claims**

1. In a tiltable storage bin adapted to receive and store scrap lengths of copper cable or like materials and having a bin body including a front wall, a back wall, and respective side walls whose upper edges together define a top area of the bin body, and a bottom wall, and a base frame on which said bin body is mounted for tilting movement for unloading the bin body, the improvement comprising a top plate extending between and attached to said side wall upper edges and to said front wall upper edge leaving an open unloading portion of said bin body top area adjacent to said back wall and extending between said side walls, said top plate having means defining an elongated deposit opening therethrough and extending substantially parallel to said bin body front wall for depositing materials in said bin body, said deposit opening having respective parallel front and rear edges and end edges extending therebetween, each of said front and end edges of said deposit opening being spaced inwardly a distance away from its associated bin body wall, an upstanding security deposit cover hood attached to said top plate adjacent to said rear edge of the deposit opening and including vertical end plate portions attached to said top plate respectively adjacent to said end edges of the deposit opening, said hood projecting upwardly from said top plate and forwardly in the direction of said front edge of the deposit opening to present a bin deposit area facing substantially towards said front wall of the bin body, a pivotable security deposit cover having hinge means connecting the cover to and along the length of said front edge of said deposit opening for movement between an open position and a closed position of the cover, said cover comprising a first plate portion extending from said cover hinge substantially the width of said deposit opening to said hood for closing said deposit opening when said cover is in its open position, and a second plate portion extending from said cover hinge in direction towards said front wall of the bin body and lying substantially adjacent to said top plate for receiving said materials when said cover is in its said

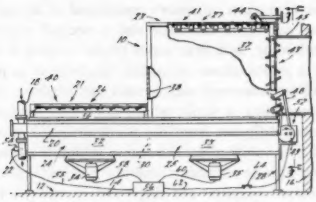


open position and having size to close said bin deposit area provided by said hood when said cover is in its closed position, said cover plate portions being disposed with respect to each other whereby, when said cover is pivoted on said hinge to its said closed position, said cover plate portions are disposed to drop said materials thereon into said bin body, said cover plate portions further being disposed with respect to each other and with respect to said hood to obstruct access by the hand to the interior of said bin body via said deposit opening when said security deposit cover is in both of its said open and closed positions and in all intermediate positions of said cover, and an openable unloading cover covering said open top area portion of said bin body and having lock means for locking said unloading cover in a closed position thereof covering said open top area portion, said upper edges of said bin body side walls having respective horizontal edge portions extending outwardly from said front wall upper edge, and respective diagonal edge portions extending downwardly and rearwardly from the respective of said horizontal edge portions to said rear wall of the bin body, said top plate extending rearwardly of said hood, and said unloading cover having a forward edge having hinge means hingedly attaching the cover on and along the length of said top plate rearward edge, said unloading cover extending downwardly and rearwardly to said rear wall of the bin body and between said respective diagonal edge portions of said bin body side walls when the cover is in its closed position.

4,275,831
MAKE UP AIR SYSTEM

Jeffrey O. Smith, Birmingham, Mich., assignor to SBS Corporation, Rochester, Mich.

Filed Dec. 26, 1978, Ser. No. 972,775
Int. Cl.[3] G05D 23/00
U.S. Cl. 237—2 R 6 Claims



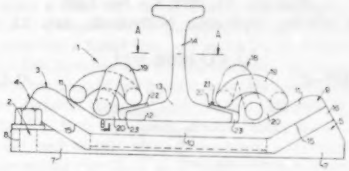
1. In an industrial system associated with a building and utilizing a process in which the temperature of a cooling fluid is increased in the process and the fluid is recirculated and is cooled to be reused in the process and in which make up air is to be brought into the building at a selected temperature, apparatus for cooling the fluid and for providing heated make up air to the building comprising: tube means including cooling tubes located outside the building and circulating the fluid to be cooled, first and second input chambers located on one side of said cooling tubes and adapted to direct air towards said cooling tubes, a fan located in each of said input chambers and being selectively operable for forcing air from the atmosphere over said cooling tubes whereby the fluid is cooled and the temperature of the cooling air is raised, first and second output chambers located on the opposite side of said cooling tubes with said first and second output chambers being associated with said first and second input chambers, respectively, whereby said output chambers receive the heated air after it is forced over said cooling tubes, said first output chamber having a first opening connected with the building and being operable for directing heated make up air from said first output chamber into the building, said second output chamber having a second opening operable for directing the heated air to the atmosphere, control means operatively connected with each of said fan for separately actuating the same in response to the fluid temperature of the fluid being cooled whereby the fluid will be cooled to a desired temperature, said control means operatively connected with said first output chamber and with said fan associated with said first input chamber and being responsive to the temperature of the fluid being cooled for controllably varying the amount of heated make up air directed into the building as a function of the temperature of the fluid being cooled.

4,275,832
RESILIENT SUPPORT MEANS

Dennis Kenyon, Leicester, England, assignor to Dunlop Limited, London, England

Filed Nov. 13, 1978, Ser. No. 959,606
Claims priority, application United Kingdom, Nov. 18, 1977, 48058/77
Int. Cl.[3] E01B 9/62
U.S. Cl. 238—310 11 Claims

1. A rail assembly comprising a rail having a rail head for directly supporting a vehicle wheel and resilient support means securing said rail to a rail bed, said resilient support means comprising a rigid rail location member to which said rail is fastened and a base member, a layer of elastomeric material between confronting surfaces of said rail location member and base member, said elastomeric material being disposed on either side of said rail and providing the sole significant load bearing connection between said base member and said rail location member for both vertical and lateral stresses under

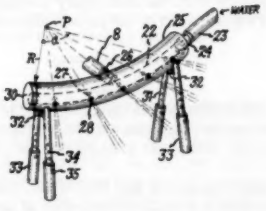


normal conditions, at least one of said confronting surfaces on each side of said rail being inclined relative to the vertical and horizontal so that lateral steering forces applied to said rail head are resisted by a combination of shear and compression forces in said elastomeric material, the base member being free of any substantial structure extending above said rail location member.

4,275,833
SNOW-MAKING APPARATUS

Brian H. Fairbank, P.O. Box 143, Hancock, Mass. 01237

Filed Jan. 21, 1980, Ser. No. 113,477
Int. Cl.[3] A01G 15/00
U.S. Cl. 239—2 S 5 Claims



1. An improved snow-making nozzle of the type consisting of an inner water-carrying pipe having a plurality of apertures within an outer air-carrying jacket having a plurality of apertures wherein the improvement comprises:

both said inner pipe and said outer jacket having a curvilinear configuration for causing said water and air to exit in a plurality of streams which do not contact and interfere with each other until snow formation occurs, for distributing snow for long operating periods of time without freeze-up, said curvilinear inner pipe and said curvilinear outer jacket having a radius of curvature determined by the ratio of the linear separation distance h between a center portion of said outer jacket in a line l defining the shortest linear distance between the ends of said outer jacket, said inner pipe and said outer jacket have a calculated radius of curvature between 10/feet and 2 feet.

4,275,834

PROCESS AND APPARATUS FOR THE ELECTROSTATIC SPRAYING OF ELECTRICALLY CONDUCTIVE PAINT

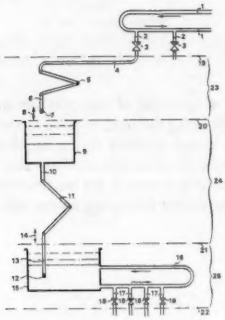
Albertus C. Spanjersberg, Leiderdorp, Netherlands; Hans G. Mink, Stuttgart, Fed. Rep. of Germany, and Johannes H. M. Barwegen, Apeldoorn, Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Jan. 11, 1979, Ser. No. 2,804

Claims priority, application Netherlands, Jan. 11, 1978, 7800307

Int. Cl.³ B05B *5/02*

U.S. Cl. 239—3 **31 Claims**



1. In a process for the electrostatic spraying of an electrically conductive liquid coating material wherein the liquid to be sprayed is intermittently fed while free of electric charge from a main supply system to a buffer supply vessel and intermittently fed from the buffer supply vessel to a second vessel which contains a supply of liquid to be sprayed and is continuously electrically charged during operation, the latter vessel being connected to at least one spray unit for spraying the liquid, the main supply system being electrically insulated from the spray liquid supply vessel, the improvement which comprises charging the liquid material in the buffer supply vessel before the liquid in the buffer supply vessel or the parts conductively connected thereto are at a spark-over or charge-bridging distance from the electrically charged liquid in the spray liquid supply vessel or the parts conductively connected thereto.

4,275,835

CORROSION INHIBITING ARTICLES

Boris A. Miksic, 21 Black Oak Rd., North Oaks, Minn. 55110, and Robert H. Miller, 535 S. Lexington Ave., St. Paul, Minn. 55116

Continuation-in-part of Ser. No. 36,317, May 7, 1979, abandoned, which is a continuation-in-part of Ser. No. 924,977, Jul. 17, 1978, abandoned. This application Mar. 17, 1980, Ser. No. 130,848

Int. Cl.³ C23F *11/02*; B32B *3/26, 5/18*

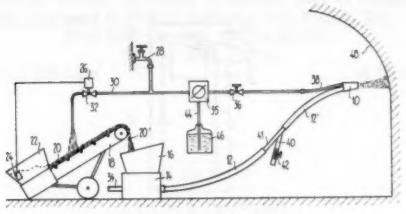
U.S. Cl. 239—60 **2 Claims**

1. An adhesive backed carrier and corrosion inhibitor in strip form for placing into an atmosphere wherein an article is located which requires corrosion protection from the atmosphere surrounding the article wherein the carrier and corrosion inhibitor are operable for quickly inhibiting atmospheric corrosion of the article from the atmosphere through volatilization and air diffusion of volatile vapor phase corrosion inhibitors located in the carrier; said carrier comprising an isocyanate-derived polymer carrier having an interconnecting skeleton network defining a plurality of passages therein, said carrier having a minimum of 90% open area, said carrier having dispersed in the passages of said carrier vapor phase corrosion inhibitors in crystal form, said vapor phase corrosion inhibitors dispersed in said carrier comprising vapor phase corrosion inhibitors capable of vaporizing under ambient conditions of the atmosphere surrounding the article to be protected, said vapor phase corrosion inhibitors comprised of at least a first vapor phase corrosion inhibitor and a second vapor phase corrosion inhibitor, said first vapor phase corrosion inhibitor comprising a vapor phase corrosion inhibitor of a predetermined vapor pressure and said second vapor phase corrosion inhibitor comprising a vapor phase corrosion inhibitor of a vapor pressure different from the predetermined vapor pressure of said first vapor phase corrosion inhibitor so that when said first vapor phase corrosion inhibitor and said second vapor phase corrosion inhibitor are dispersed in said carrier said carrier contains vapor phase corrosion inhibitors of unequal vapor pressure dispersed throughout said carrier to thereby provide multiple sites for volatilization of said first vapor phase corrosion inhibitor and said second vapor phase corrosion inhibitor from said carrier into the atmosphere surrounding said carrier, said first vapor phase corrosion inhibitor and said second vapor phase corrosion inhibitor selected from a group of vapor phase corrosion inhibitors consisting of a first group of vapor phase corrosion inhibitors having a vapor pressure of less than 10^{-4} mm Hg at ambient conditions, said first group consisting of the following corrosion inhibitors: Cyclohexylamine Chromate, Cyclohexylamine M-Mononitro Benzoate, Dicyclohexylamine Chromate and Dicyclohexylamine Nitrite; a second group of vapor phase corrosion inhibitors having a vapor pressure ranging from 10^{-3} mm Hg to 10^{-4} mm Hg, at ambient conditions, said second group consisting of the following corrosion inhibitors: Cyclohexylamine Benzoate, Diethanolamine Benzoate, and Benzotriazole, and a third group of vapor phase corrosion inhibitors having vapor pressure above 10^{-3} mm Hg at ambient conditions, said third group consisting of the following corrosion inhibitors: Monoethanolamine Benzoate and Tolyltriazole, wherein the total vapor phase corrosion inhibitors located in said carrier includes a minimum of 5% by weight of vapor phase corrosion inhibitors selected from at least two of said first group, said second group or said third group, said vapor phase corrosion inhibitor in said carrier comprises a minimum density of vapor phase corrosion inhibitor of 0.05 grams per cubic centimeter, wherein if one vapor phase corrosion inhibitor is selected from said first group and one vapor phase corrosion inhibitor is selected from said third group, the major amount of vapor phase corrosion inhibitor being selected from said first group and the minor amount of vapor phase corrosion inhibitor being selected from said third group, said first vapor phase corrosion inhibitor, said second vapor phase corrosion inhibitor and said interconnecting network located in said carrier coacting with said passages in said carrier to quickly permit said first vapor phase corrosion inhibitor and said second vapor phase corrosion inhibitor to reach a saturation level in the atmosphere surrounding said carrier through volatilization and diffusion of said first vapor phase corrosion inhibitors and said second vapor phase corrosion inhibitor from sites in said carrier and through said passages in said carrier, said first vapor phase corrosion inhibitor and said second vapor phase corrosion inhibitor synergetically coacting with said carrier to produce an extended saturated level of corrosion inhibitor in an atmosphere surrounding said carrier, said carrier being enclosed in an enclosing means to prevent premature dispersion of said vapor phase corrosion inhibitor.

4,275,836
METHOD AND APPARATUS FOR SPRAYING CONCRETE

Hansruedi Egger, Zumikon, Switzerland, assignor to Intradym Maschinen AG, Winterthur, Switzerland

Filed Sep. 17, 1979, Ser. No. 75,988
Claims priority, application Switzerland, Sep. 22, 1978, 9927/78
Int. Cl.³ B05B *9/00*
U.S. Cl. 239—124 **9 Claims**



8. An apparatus for spraying concrete by means of compressed air, comprising:

means for conveying a concrete mass in a continuous stream along a predetermined path of travel;

means cooperating with said conveying means for spraying the conveyed concrete mass;

moisture feeler means for measuring the water content of the concrete mass;

said moisture feeler means being arranged along the conveying path of the concrete mass;

a dosing device for infeeding water to the concrete mass operatively connected with said moisture feeler means;

said concrete conveying means comprising a spraying machine including means for infeeding compressed air for conveying the concrete mass;

said spraying means including a spray nozzle operatively connected by means of a conveying hose with the spraying machine;

compressed air-exhaust means defining a branch-off location arranged along the conveying path of the concrete mass and serving to exhaust compressed air into the surroundings continuously and concurrently with the spraying of the concrete mass;

said branch-off location being spaced from said spray nozzle and arranged at the conveying hose;

said conveying hose including a portion extending between said branch-off location and said spray nozzle which defines a braking path for the concrete mass in order to decelerate the same for controlling application of the sprayed concrete mass onto a surface; and

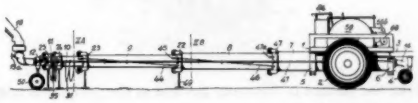
said branch-off location having an adjustable opening.

4,275,837
MOBILE APPARATUS ADAPTED TO FORM A DUCT FOR LIQUID FLOWS, PARTICULARLY FOR IRRIGATION PURPOSES

Dante Baroni, Via Grossi, 6, Mantova, and Adelelmo Baroni, Via Giovanni XXIII, S. Nicolo' PO, Mantova, both of Italy

Filed Sep. 18, 1979, Ser. No. 76,632
Claims priority, application Italy, Sep. 26, 1978, 18125 A/78
Int. Cl.³ A01G *25/00*
U.S. Cl. 239—197 **7 Claims**

1. A mobile apparatus adapted to form a duct for liquid flows, particularly for irrigation purposes, comprising a series of telescopically coupled pipes, the largest diameter pipe in said pipe series being attached to a wheel-mounted frame for position changing and provided at one end with a fitting for connection to a pressurized liquid supply line, and the smallest diameter pipe in said pipe series carrying at one end means for ejecting liquid in a desired condition, e.g. an irrigator, each pipe in said pipe series being provided with means enabling said pipes to be run out one by one to an appropriate extent, starting from said largest diameter pipe in said pipe series, under the influence of the pressure applied by said liquid when pumped into said pipe series, and with suitable sliding connection and sealing means; means for causing said pipe series to rest onto the ground; and means for telescopically collapsing said pipes in said pipe series from a fully extended position thereof to a telescopically packaged position wherein each of said pipes has a liquid inlet end and a liquid outlet end and a head at said liquid outlet end, said head having a ridge thereon, and wherein each of said pipes in said pipe series excepting said largest diameter pipe and said smallest diameter pipe has on said head at least two hooks symmetrically arranged around the pipe, each of said hooks being hingedly connected to the corresponding pipe such as to rotate in a substantially radial plane between a position engaging said ridge on said head of the contiguous pipe having a smaller diameter, and a position



disengaged from said ridge, said hooks being each connected to a respective spring accommodated on a corresponding of said heads such as to cause the corresponding of said hooks to rotate towards said engaging position thereof, and to one end of a respective cord having an other end attached to said head of the contiguous pipe having a larger diameter, the length of said cord being such as to cause said cord to come under tension and lock the respective of said pipes from sliding further out and the respective of said hooks from rotating, against the bias of said spring, towards said disengaged position thereof upon said respective pipe reaching its fully extended position, thereby the contiguous smaller diameter pipe is released and allowed to move out under the influence of the pressure of said liquid, each of said hooks having a back portion shaped such that the pressure exerted thereon during the collapsing phase of said pipe series by said ridge provided on the head of the smaller diameter contiguous pipe causes the raising thereof and re-hooking of said head.

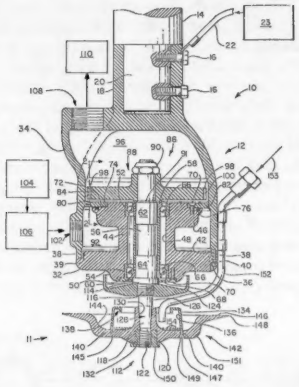
4,275,838
ROTATING ATOMIZING DEVICE

Dennis L. Fangmeyer, Indianapolis, Ind., assignor to Ransburg Corporation, Indianapolis, Ind.

Continuation-in-part of Ser. No. 832,587, Sep. 12, 1977, abandoned. This application Feb. 21, 1979, Ser. No. 13,125
Int. Cl.³ B05B *3/10*
U.S. Cl. 239—223 **7 Claims**

4. An atomizer for attachment to a drive motor output shaft to be spun thereby, the atomizer including a central portion having an outwardly flaring radially inner surface and an outer portion having a flat generally disk-shaped surface joining the central portion inner surface, the atomizer further including a coating material cup having an outwardly flaring inner surface, the maximum diameter portion of the cup defining the base thereof, the outwardly flaring surfaces of the cup and central portion flaring in opposite directions, the cup including a right circular cylindrical lower wall portion and the atomizer central portion including a groove for receiving the lower wall portion for attaching the cup to the atomizer central portion, and the cup being provided with a plurality of apertures adjacent its base to provide communication between the cup inner surface and the central portion inner surface, and means for dispensing fluid coating material on the cup inner surface, fluid coating material dispensed on the cup inner surface as the

atomizer is spun moving radially outwardly toward its base, through the apertures, along the central portion inner surface



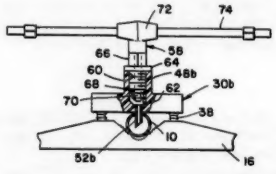
and the flat surface of the outer portion to the peripheral edge where it is atomized.

4,275,839

COMBINATION STABILIZER AND SPRINKLER SUPPORT FOR SURFACE HOSE

Donald O. Olson, 8765-I Olive La., Santee, Calif. 92071

Filed Oct. 1, 1979, Ser. No. 80,288
Int. Cl.³ A62C *31/22*
U.S. Cl. 239—272 **8 Claims**



1. A stabilizing device for holding a hose in a preselected position on the ground and preventing it from twisting or turning due to residual stresses, comprising:

a base member adapted to extend transversely to the hose being stabilized, having a central portion provided with a recess for receiving the hose and integral arms extending from opposite sides thereof; and

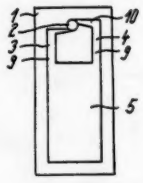
clamp means extending across said recess connectable with said central portion of said base member and adapted to bear against, and hold firmly, a hose extending through said recess so as to prevent the hose from twisting, wherein said central portion includes a pair of top surfaces on said central portion on opposite sides of said recess and having respective smoothwalled openings; said clamp means including an elongated body portion parallel with said base member and provided adjacent its ends with integral, downwardly projecting pin portions having barbs, adapted to interlock with the walls of the openings upon direct axial force on said pin portions.

4,275,840

PACKAGE FOR STORING AND SPRAYING SMALL AMOUNTS OF LIQUIDS

Marcel J. H. Staar, Brussels, Belgium, assignor to Panpack A.G., Vaduz, Liechtenstein

Filed Jul. 9, 1979, Ser. No. 55,515
Claims priority, application Belgium, Dec. 15, 1978, 872803; Fed. Rep. of Germany, Jun. 5, 1979, 2922740
Int. Cl.³ B65D *1/32*
U.S. Cl. 239—327 **18 Claims**



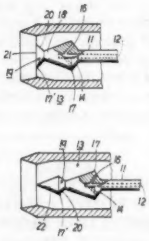
1. A package for storing and spraying small amounts of liquid, said package comprising two sheet sections which are joined, and together provide a compressible container for storing, a conterminous system of passageways for conveying and a nozzle for spraying said liquid, said passageway system receiving liquid from the container and accelerating said liquid when pressure is applied to said container, said passageway system terminating substantially tangentially in at least one substantially circular turbulence space for imparting a whirling motion to liquid conveyed to said space, said turbulence space having at least one central nozzle aperture for discharging the liquid from the turbulence space in the form of a spray.

4,275,841

BURNER FOR COMBUSTION APPARATUS

Toshiro Takeyama, and Shigemori Ohtani, both of Sendai, Japan, assignors to Kabushikikaisha Ohkawara Seisakusho, Yoshida, Japan

Filed Dec. 14, 1978, Ser. No. 969,544
Claims priority, application Japan, Dec. 28, 1977, 52/157456
Int. Cl.³ B05B *7/04*
U.S. Cl. 239—431 **2 Claims**



1. A burner for combustion apparatus comprising an atomizer and a nozzle within said atomizer to define an air passageway therebetween, said nozzle defining an axial fuel passageway disposed interiorly of said nozzle, a tip portion, a first frustoconical portion diverging in the downstream direction a first conical portion converging in the downstream direction extending from the widest portion of the first frustoconical portion, said first frustoconical portion and said first conical portion blocking said tip portion, said first frustoconical portion diverging from said tip portion toward the extreme end of said nozzle and defining a plurality of fuel outflow passageways connected to said axial fuel passageway, said fuel outflow

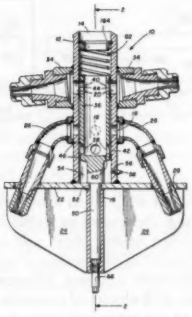
passageways being positioned to flow fuel backwardly from the fuels forwardmost position in the axial fuel passageway until met by air passing over the diverging first frustonical portion, and a second frustoconical portion diverging in the downstream direction extending from the narrowest portion of said first conical portion converging in the downstream direction.

4,275,842

DECOKING NOZZLE ASSEMBLY

Robert M. Purton, and Lloyd D. Hanson, both of Cerritos, Calif., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 21, 1979, Ser. No. 96,704
Int. Cl.³ A62C *31/00*
U.S. Cl. 239—446 **6 Claims**



1. An improved decoking nozzle comprising:

a hollow body member having a side wall, a closed lower end, and an open upper end arranged to be connected with a decoking system, said body member having flow ports extending through said side wall, said flow ports including a pair of upper ports diametrically opposed and four lower ports located about ninety degrees apart around the circumference of said body;

upper nozzle means connected to said side wall for fluid communication with said upper ports;

lower nozzle means connected to said side wall for fluid communication with said lower ports;

valve means slidingly disposed in the interior of said hollow body member, said valve means including seal means sealingly engaging said side wall;

valve control means for moving said valve means between a first position permitting flow through said lower nozzle means while preventing flow through said upper nozzle means and a second position preventing flow through said lower nozzle means while permitting flow through said upper nozzle means; and,

said valve means also including a hollow valve member having a pair of upper apertures, which in the second position of said valve means are in communication with said upper ports, and four lower apertures, which in the first position of said valve means are in communication with said lower ports.

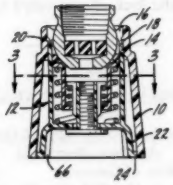
4,275,843

AUTOMATICALLY ADJUSTABLE SHOWER HEAD

Alfred M. Moen, Grafton, Ohio, assignor to Stanadyne, Inc., Windsor, Conn.

Filed Nov. 14, 1979, Ser. No. 94,293
Int. Cl.³ B05B *1/26*
U.S. Cl. 239—499 **2 Claims**

1. An automatic pressure-responsive shower head including an outer housing, a body member within the housing, said body member including a generally cylindrical portion and an outwardly-flared skirt at one end, said body member being in contact with said housing at one end of said cylindrical portion and at the outer periphery of said skirt, a partition across said body member at the junction of said skirt and cylindrical portion, a swivel member and means for attaching it to said body member including a flexible body member flange positioned against said swivel member on one side of a diameter and a seal ring positioned between said body member and swivel on the other side of the same diameter, a cup-shaped retainer having an outwardly-flared end positioned within said body member, a spring seated on said partition and urging said flared end



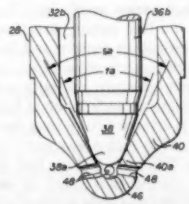
against said seal member, a water passage in said body member partition in communication with said swivel member through an aligned opening in said retainer, a control member extending through the aligned openings in said partition and retainer and having an enlarged head outside of said body member partition to perform a water control function therewith, said control member having outwardly-extending flange means with spaces therebetween, a spring seated on said retainer and acting against said flange means to urge said control member head toward said partition, the spaces between said control member flange means providing water communication between said swivel and said body member partition water passage, water flowing from said swivel toward said control member urging said enlarged head away from said body member partition water passage.

4,275,844

FUEL INJECTION NOZZLE

William A. Grgurich; Albert B. Niles, and Kenneth W. Updyke, all of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US 79/01091, § 371 Date Nov. 30, 1979, § 102(e) Date Nov. 30, 1979
This PCT application filed Nov. 30, 1979, Ser. No. 143,583
Int. Cl.³ F02M *61/18*
U.S. Cl. 239—533.3 **12 Claims**



1. A fuel injection nozzle (**22**) comprising:

a housing (**28**), said housing (**28**) having a valve guide (**34**) of a first diameter (dg) separating a closed upper fluid cavity

(32*a*) from a lower fluid cavity (32*b*), and having a conical seat (40) of a first constant conical angle (sa), said seat (40) including a lower portion (40*a*);

means for engaging only said lower portion (40*a*) of said seat (40), said means being a valve (36) reciprocable in said housing (28), said valve (36) having a conical tip (38) of a second constant conical angle (ta) less than said first angle (sa), said tip (38) including a lower portion (38*a*) having an interference fit with said lower seat portion (40*a*), said valve (36) having an enlarged diameter portion (36*c*) reciprocable in said guide (34), said enlarged diameter portion (36*c*) being of a second diameter (dv) less than said first guide diameter (dg), said diameters (dv,dg) defining a clearance sufficient for metering an amount of fluid between said upper (32*a*) and lower (32*b*) cavities for maintaining relative fluid pressures in said cavities (32*a*,32*b*) to avoid a hydraulic lock of said valve (36) in said housing (28).

4,275,845

FUEL INJECTOR FOR INTERNAL COMBUSTION ENGINES

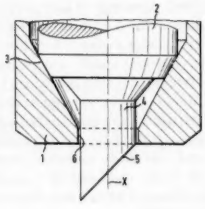
Eckart Müller, Schwabach, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Nurenberg, Fed. Rep. of Germany

Filed Apr. 11, 1979, Ser. No. 29,080

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1978, 2814999

Int. Cl.³ B05B *1/30*

U.S. Cl. 239—533.12 **7 Claims**



1. A fuel injector for internal combustion engines, comprising in combination:

a nozzle body having a bore centrally arranged therein and operatively communicating with said internal combustion engine; and

a nozzle needle having a valve seat for providing supporting contact with a correspondingly shaped portion of said nozzle body, said nozzle needle being axially displaceable in said body in the longitudinal direction thereof for movement between a closed state of said injector, wherein said valve seat is in contact with said nozzle body, and varying degrees of an opened state of said injector, wherein said valve seat is lifted off said nozzle body by fuel pressure to allow fuel to pass to said centrally arranged bore, said nozzle needle including a throttling pin determinative for fuel stream directions as well as fuel stream characteristic or pattern and having an end face which, at least during a portion of said open states of said injector, projects into said centrally arranged bore, said throttling pin being provided with at least one smooth flat surface which is arranged to receive fuel thereagainst and which is arranged in such a way as to vary at least one of the fuel stream directions and the fuel stream characteristic or pattern during movement of said nozzle needle between said closed and open states of said injector, said at least one flat surface being a flat portion having a plane extending substantially parallel to the longitudinal axis of said nozzle body and being a control edge on said end face of said throttling pin, at least a portion of said end face of said throttling pin always projecting into said bore.

4,275,846

CONTAINER FOR ELECTROSTATIC SPRAYING OF LIQUIDS

Ronald A. Coffee, Haslemere, England, assignor to Imperial Chemical Industries Limited, London, England

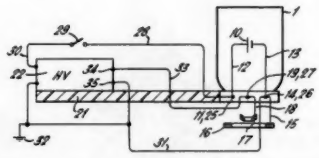
Filed Sep. 24, 1979, Ser. No. 78,434

Claims priority, application United Kingdom, Sep. 26, 1978, 38180/78

The portion of the term of this patent subsequent to Jun. 24, 1997, has been disclaimed.

Int. Cl.³ B05B *5/02*

U.S. Cl. 239—690 **12 Claims**



1. A liquid container adapted to form part of apparatus for electrostatic spraying, the apparatus including a power supply, high voltage generator having input and output terminals, a spray nozzle at least part of the surface of which is electrically conductive, an electrode disposed adjacent the nozzle and insulated therefrom, with electrical connections for connecting the power supply to the input terminals of the generator and the electrode to one output terminal of the generator and the nozzle to the other output terminal of the generator; said container comprising:

a body having an orifice for delivering liquid; means for detachably mounting the container on the rest of the apparatus in a position in which the orifice can deliver liquid to the spray nozzle, the mounting means including a conductor or conductors forming part of the electrical connections for the apparatus; and a closure or seal for closing the orifice prior to location of the container on the rest of the apparatus.

4,275,847

PROCESS FOR THE TREATMENT OF ALUMINUM-SALT SLAGS

Albert Bahr, Daniel-Flach-Str. 3, 3392 Clausthal-Zellerfeld, Fed. Rep. of Germany, and Joachim Kues, Göttingen, Fed. Rep. of Germany, assignors to Albert Bahr, Clausthal-Zellerfeld, Fed. Rep. of Germany

Filed Jul. 2, 1979, Ser. No. 55,189

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1978, 2830574

Int. Cl.³ B02C *23/14*

U.S. Cl. 241—20 **10 Claims**

1. A process for the treatment of an aluminum-salt slag containing NaCl and KCl, oxides and hydroxides produced in the remelting of aluminum by the addition of salt to the aluminum scrap, said process comprising the stages of:

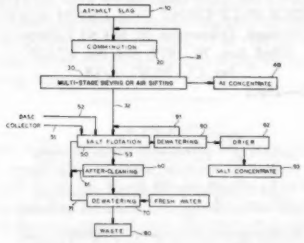
(a) comminuting the aluminum-salt slag with pressure and impact and rolling the comminuted product to a thickness of about 0.2 mm to about 1 mm;

(b) milling the rolled product of step (a) to an X_{80} value of about 130 to 150 microns to produce a milled product;

(c) classifying the milled product of step (b) in a plurality of stages to recover therefrom a large-particle fraction consisting at least predominantly of aluminum particles, and a fine-particle fraction containing NaCl and KCl;

(d) subjecting said fine-particle fraction to a high-salt-con-

centration flotation in at least one flotation stage to which a base is added in an amount of 0.04 to 0.4 g. of the base per ton of the material subjected to flotation to bring the pH of said one flotation stage to a pH value between 10 and 11, whereupon a cation active collector is added which is selected from the group which consists of compounds of the formula $RO—(CH_2)_n—NH—(CH_2)_n—NH_2$ and of the formula $RO—(CH_2)_n—NH_2$ wherein R is a straight or branched chain saturated or unsaturated



alkyl having 8 to 22 carbon atoms or mixture thereof, and n is 1 to 5, or an organic or inorganic salt thereof, to recover an impurity-containing froth of low chloride level with oxides and hydroxides and a concentrate containing most of the chlorides of the salts including the KCl and NaCl, of said slag;

(e) recycling flotation liquor from the products obtained in step (d) to the flotation stage thereof; and

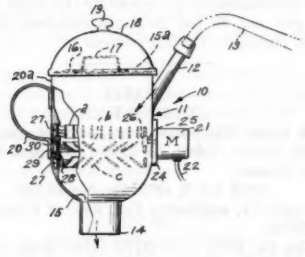
(f) dewatering said concentrate of step (d).

4,275,848

PORTABLE GARBAGE DISPOSAL UNIT

Alexander Webb, Sr., 14914 Seeley, Harvey, Ill. 60426

Filed Oct. 4, 1979, Ser. No. 81,813
Int. Cl.³ B02C *18/18*
U.S. Cl. 241—46 B **1 Claim**



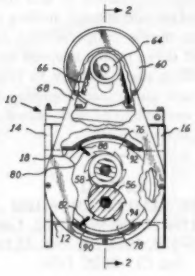
1. A portable garbage disposal unit, comprising, in combination, an upright, cylindrical container, for placement of garbage therein, so as to be ground up and mixed with water, for then being flushed outward therefrom, a carrying handle on a side of said container, an external electric motor mounted on a side of said container, a plurality of three axially aligned, spiral cutters inside said container along a central vertical axis of said container, a transmission between said motor and said cutters, for rotation of said cutters; a water intake neck, at an upper portion of said container, for delivering water down upon said cutters, a downward neck at the bottom of said container, for discharge of said water and said garbage, after being ground up on said cutters; a top opening on said container, for placement of said garbage therein, a removable cover closing said opening; and said spiral cutter comprising a spiral-shaped, flat blade, said blade of the uppermost said cutter being parallel to said container vertical axis, said blade of a lowermost said cutter being downwardly, outwardly inclined, while said blade of an intermediate said cutter is upwardly, outwardly inclined, and upper edges of said blades are toothed, a circular ring gear secured around each said cutter, and said transmission comprises gears between edges of said ring gears powered from said motor, so as to rotate said ring gears and their cutters.

4,275,849

MACERATOR

William M. Chambers, 14404 Gramercy Pl., Gardena, Calif. 90249

Filed May 25, 1973, Ser. No. 363,875
Int. Cl.³ B02C *23/36*
U.S. Cl. 241—46.06 **8 Claims**



1. Apparatus for shredding solid debris passed along a sewage conduit, comprising:

a shredder assembly including cooperating substantially parallel first and second shredding stacks respectively having a plurality of first concentric knives mounted on a first shaft in interspaced relationship with a plurality of second knives mounted concentrically on a second shaft, said first and second stacks being compressed between first and second distally opposed bearing plates having received therein for rotation said first and second shafts, said bearing plates being secured in compression against said stacks by compression nuts threadably engaging the distal ends of said shafts;

a housing conformed to receive in telescoping cooperation said shredder assembly including transversely opposing tubular sections adapted to be secured to said sewage conduit;

securing means adapted to be attached to said shredder assembly for securing thereof in said housing;

directing means disposed longitudinally along the interior of said housing in converging receiving alignment with one said tubular section for directing the debris received therein into said shredder assembly;

gearing means disposed on adjacent one ends of said first and second shafts for coupling the rotations thereof in common; and

drive means adapted to connect to the other end of said first shaft for driving said shaft in rotation.

4,275,850

PLATE-TYPE PAINT GRINDING MACHINE AND ITS USE IN PIGMENT TESTING

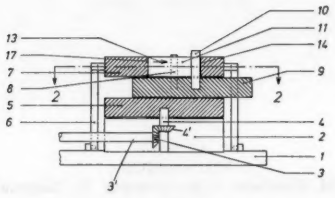
Bruno Knapstein, Cologne, and Friedrich Vial, Leichlingen, both of Fed. Rep. of Germany, assignors to Kronos Titan G.m.b.H., Leverkusen, Fed. Rep. of Germany

Filed Jun. 1, 1979, Ser. No. 44,564

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1979, 2824163

Int. Cl.³ B02C *19/00*

U.S. Cl. 241—57 10 Claims



1. Apparatus adapted for grinding which comprises a base member; a first mulling plate disposed horizontally on said base member; a support member connected to said base member for engaging and supporting a second mulling plate disposed horizontally and in superposed relation to said first mulling plate; guide means disposed on said second mulling plate and operatively engaging stop means cooperatively disposed on said support member and drive means adapted upon actuation to rotate said first mulling plate thereby to rotate said second mulling plate until said guide means engage said stop means thereby to limit the movement of said second mulling plate in relation to said first mulling plate.

4,275,851

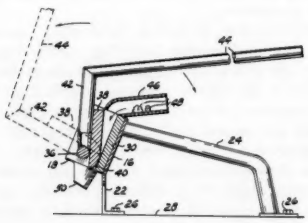
ORE SAMPLE CRUSHER

Charles W. Weese, 1150 N. 200 West #32, Lehi, Utah

Filed Sep. 4, 1979, Ser. No. 72,516

Int. Cl.³ B02C *1/04*

U.S. Cl. 241—169 2 Claims



1. An ore sample crusher, comprising:

a generally U-shaped upright frame characterized by a flat bight portion having parallel legs vertically disposed edgewise;

a pair of standards secured to and supporting the bight portion of said frame on an incline;

a planar anvil overlying and secured to said frame bight portion;

jaw means supported by said frame for movement toward and away from said anvil,

said jaw means comprising, a shaft extending between and journaled by said frame legs,

a jaw extending transversely between said frame legs and secured at one end portion to said shaft in spaced relation with respect to said anvil, and,

handle means secured to said shaft and said movable jaw opposite the anvil;

an ore sample receiving hopper secured to the upper limit of said frame for communication with the spacing between said anvil and said jaw; and,

a crushed ore receiving chute connected in depending relation with the lower limit of said frame.

4,275,852

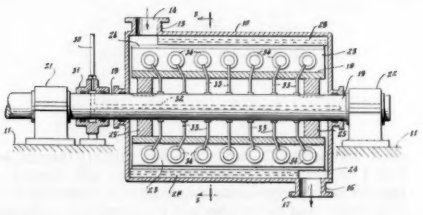
APPARATUS FOR CONTROLLING THE REFINING OF FIBROUS PULP GRIST IN A DRUM REFINER

Arne J. A. Asplund, Tykovagen 20, 181 61 Lidingo 3, Sweden

Filed Aug. 20, 1979, Ser. No. 67,929

Int. Cl.³ B02C *18/18*

U.S. Cl. 241—259.2 5 Claims



1. In a drum refiner for refining pulp stock, in which the pulp grist is conveyed into a stationary cylindrical drum and propelled in a linear direction therein by a co-axial rotor comprising a plurality of wings having a leading face and a trailing face which attack the grist at an angle in a wedging action as its is pushed ahead by the leading face of the wing in a pulsating fashion to induce in the grist internal frictional shear forces while being squeezed through a gap clearance defined between the free end of the wings and shear means arranged axially along the interior cylindrical wall surface of the stationary drum, the improvement comprising:

blade means mounted adjustably along a surface of said wings so as to be deflected at an angle thereto and effective simultaneously to coordinate the angle of attack on the grist and the gap clearance variations in energy demand during the refining process.

4,275,853

CUTTING TOOL

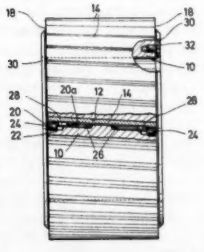
Ulrich H. Kreuz, Hölderlinweg 18, 7141 Erdmannhausen, and Kurz H. Wendel, Talstr. 45, 7250 Leonberg 5, both of Fed. Rep. of Germany

Filed Jul. 5, 1979, Ser. No. 54,789

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1978, 2829732

Int. Cl.³ B02C *1/10;* B27G *13/00;* B26D *1/12*

U.S. Cl. 241—294 11 Claims



1. A cutting tool comprising a supporting body and at least one striplike cuttng element, the supporting body comprising a

recess for receiving the cutting element such that the cutting element abuts a bearing wall being provided by said recess, and disposed opposite said bearing wall, a clamping body comprising a deformable material, said clamping body being located in a cavity adjacent the cutting element for clamping the cutting element between said bearing wall and the clamping body, guide means for a rigid thrust piece closing said cavity and being disposed adjacent a recess in said cutting element, tightening means for pressing the thrust piece against said clamping body which fills said cavity such that when the tightening means is actuated said thrust piece engages said recess of the cutting element and the deformable material of said clamping body transmits the pressure exerted by the thrust piece to the cutting element thereby clamping the cutting element between the clamping body and said bearing wall.

4,275,854

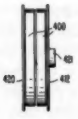
ROLLED NAIL STRIPS PACKED WITHOUT SPOOLS

J. Calvin Jureit, Coral Gables; Andrew G. Seipos, Miami, and William J. Langevin, North Miami Beach, all of Fla., assignors to Automated Building Components, Inc., Miami, Fla.

Division of Ser. No. 920,128, Jun. 28, 1978, Pat. No. 4,225,095, which is a division of Ser. No. 833,059, Sep. 14, 1977, Pat. No. 4,129,433. This application Jan. 30, 1980, Ser. No. 116,786

Int. Cl.³ B65H *75/02*; B65D *85/24*

U.S. Cl. 242—55 **4 Claims**



1. A method for forming a coiled composite of connector plate stock from which may be cut sheet metal connector plates having integrally struck teeth projecting therefrom, the coiled composite having first and second coiled lengths of connector plate stock arranged in juxtaposition with the teeth of each of the lengths of connector stock being substantially intermeshed with the teeth of the other length of connector stock, said method comprising the steps of:

winding the first and second lengths of connector stock onto a spool;

initiating said winding operation so as to establish a relationship between the first and second lengths for preventing jamming between the intermeshing teeth of the first and second lengths during said winding operation; and,

maintaining the relationship of the first and second lengths during said winding operation.

4,275,855

FILM TAKE-UP SPOOL

Hiroshi Wakabayashi, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed May 9, 1980, Ser. No. 148,270

Claims priority, application Japan, May 24, 1979, 54-68805[U]; Jul. 27, 1979, 54-104019[U]

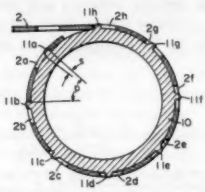
Int. Cl.³ G03B *1/04*; B65H *75/28*

U.S. Cl. 242—71.2 **6 Claims**

1. In a film take-up spool of a camera disposed within the camera body and rotatable to wind thereon a film having perforations, the improvement comprising:

a plurality of pawls projectedly provided on the outer periphery of said spool so as to be engageable with said perforations, each of said pawls being provided at a location corresponding to a respective perforation when the film has been wound on said spool, said pawls being provided so as to satisfy the following relations:

$P > Po$ and $S + N(P/n - Po) \leqq a$ (n is an integer) where S is the width of said pawl in the circumferential direction of said spool, P is the pitch between the pawls, a is the width of each said perforation in the lengthwise direction of the film, Po is the pitch between said perforations, and N is



the number of perforations present in the length of the film corresponding to the outer periphery of said spool.

4,275,856

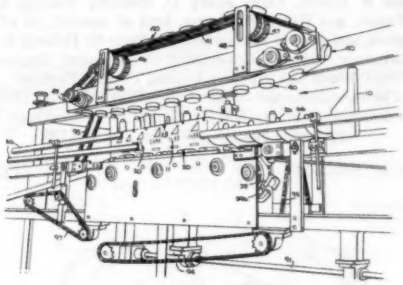
HEAT TRANSFER LABELING MACHINE

Albert J. Harvey, Fairfield, Ohio, assignor to Diamond International Corporation, New York, N.Y.

Division of Ser. No. 955,372, Oct. 27, 1978, Pat. No. 4,239,569. This application Feb. 8, 1980, Ser. No. 119,833

Int. Cl.³ B65H *75/22*; B65C *9/04*

U.S. Cl. 242—75.44 **7 Claims**



1. A system for feeding a label carrying web to a decorating station for application onto an article to be decorated which comprises:

a web supply reel;

a web take up reel;

braking means engaging said web supply reel

a movable roller disposed in the path of said label carrying web between said supply reel and decorating station;

switching means operatively connected to said braking means so as to regulate the tension of the label carrying web being dispensed from said supply reel;

means coupled to said movable roller disposed so as to activate said switching means when said roller moves to a predetermined position and modify the braking force applied to said web supply reel; and

biasing means urging said movable roller to apply tension to said label carrying web being fed from said web supply wheel.

4,275,857

COOLING SYSTEM FOR RAMJET ENGINE

M. Brian Bergsten, Centerville, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

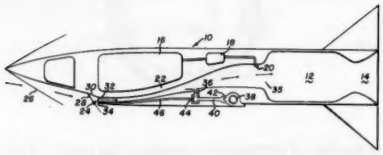
Filed Nov. 5, 1979, Ser. No. 91,220

Int. Cl.³ B64D *33/02*

U.S. Cl. 244—53 B **2 Claims**

1. A supersonic ramjet powered vehicle comprising: a mis-

sile body member; a ramjet combustor having an exit nozzle positioned at the aft end of said missile body member; a cowl lip member secured to the missile body and forming a ramjet inlet; a subsonic diffuser between said ramjet inlet and said combustor; an accessory turbine positioned adjacent said subsonic diffuser; means for supplying bleed air from said diffuser



to said turbine; a vortex tube connected between the subsonic diffuser and said accessory turbine; said vortex tube including a pressure inlet connected to said subsonic diffuser, a hot gas outlet connected to said turbine and a cold air outlet; said ramjet vehicle including a cooling load; means for connecting said cooling load to the cold air outlet of said vortex tube.

4,275,858

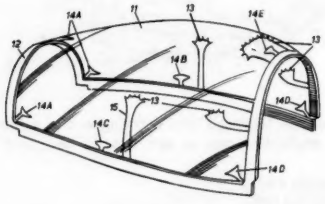
PANEL BREAKING SYSTEMS

Colin B. Bolton, Fleet; Harry D. Rylands, Woking; Clara Turner, and Henry W. Turner, both of Ashtead, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation-in-part of Ser. No. 670,531, Mar. 25, 1976, abandoned, and Ser. No. 838,451, Oct. 3, 1977, abandoned. This application Sep. 25, 1978, Ser. No. 945,106

Int. Cl.³ B64C *1/32*

U.S. Cl. 244—121 **4 Claims**



1. A method of forming a breaking apparatus into a cockpit canopy and comprising the steps of providing a canopy inner shell and a canopy outer shell, forming a layer of resin on the designated inner surface of one of the shells, embedding into the resin a plurality of conductors each having at least one region of reduced energy of fusion, attaching the other shell to the resin, and curing the resin.

3. Apparatus comprising a fusible electrical conductor incorporating at least one region of reduced energy of fusion compared with the mean in the conductor, said conductor being embedded in and in intimate contact with said panel, and said conductor being connectable to a source of a high energy pulse of electric power and operable to explode and thereby generate a crack in said panel and comprising also the high energy electrical pulse source and wherein said high energy electrical pulse source consists essentially of power supply means and at least one inductance arranged with an initiator switch and said at least one conductor in a circuit operable upon initiation to charge said inductance with energy, said inductance then providing a pulse operable to fuse said at least one conductor and having a bypass switch in a subcircuit operable to bypass said inductance until said inductance is charged.

4,275,859

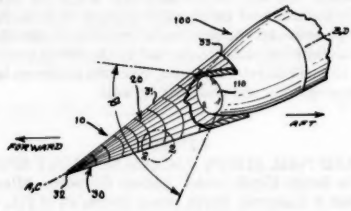
OPTICAL DOME PROTECTION DEVICE

Michael P. Bleday, Concord, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 18, 1979, Ser. No. 104,923

Int. Cl.³ B64C *1/10*

U.S. Cl. 244—121 **10 Claims**



1. An optical dome protection device for use with an airborne vehicle having a forwardly positioned, rain-erodible, thermal shock-susceptible optical dome through which an area is viewable, wherein said vehicle is travelling at speeds from sub-sonic to supersonic through an air environment in which raindrops are falling, composing:

a. means for fragmenting said falling raindrops before said raindrops reach said optical dome, wherein this raindrop fragmenting means is disposed forward of said optical dome and includes a plurality of openings smaller than said raindrops, whereby said optical dome is protected from erosion damage and destruction by said falling raindrops;

b. and, means for protecting said optical dome from thermal shock, wherein the thermal shock protecting means includes a thermal resistant cone member integrated with said raindrop fragmenting means, with said cone member disposed forward of, and attached to, said vehicle, such that said cone member together with said raindrop fragmenting means obscure less than twenty percent of said area viewable through said optical dome.

4,275,860

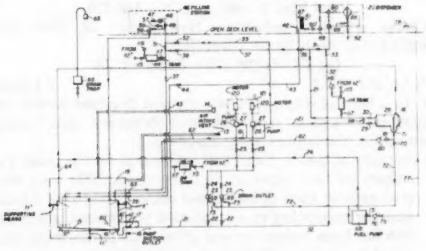
FULL SPAN SHIPBOARD FUELING SYSTEM FOR AIRCRAFT

Jack A. Brabazon, 925 Mooney Ave., Ottawa, Ontario, Canada (K2A 3A2)

Continuation of Ser. No. 812,607, Jul. 5, 1977, abandoned. This application Oct. 2, 1978, Ser. No. 947,722

Int. Cl.³ B64D *37/14, 37/18;* **B64F** *1/28*

U.S. Cl. 244—135 R **11 Claims**



1. A full span shipboard fueling system for aircraft comprising:

fuel storage means including a tank for selectively storing low and high flash point fuels;

cofferdam means enclosing said fuel storage means in a substantially dry, closed chamber;

means for supporting the tank in spaced relation with the walls of the chamber to provide a continuous airspace between all exterior sides of the tank and said walls;

an air intake vent communicating the airspace with the atmosphere;

an exhaust vent communicating the airspace with the atmosphere;

a blower disposed within the exhaust vent for continuously drawing in fresh air through the air intake vent to the airspace and withdrawing residual fuel vapours and air therefrom to maintain a concentration of any fuel vapours in the chamber below a predetermined lean limit;

a plurality of conduits for conducting the fuel to designated locations;

pump means communicating with selected ones of the conduits for controllably propelling the fuel therethrough to said locations;

filter means in serial communication with predetermined ones of said conduits for removing predetermined contaminants in the fuel when said fuel is conducted therethrough;

a unitary combined fueling and defueling dispenser at a designated location communicating with predetermined ones of said conduits for selectively fueling and defueling an aircraft;

means communicating with at least one of, the tank and said dispenser for selectively recirculating and conditioning the fuel to minimize fuel degradation from contaminants entrained therein;

means for venting said tank to the atmosphere;

a first valve disposed in a fuel delivery conduit below the dispenser and operable to shut-off fuel flow to said dispenser; and

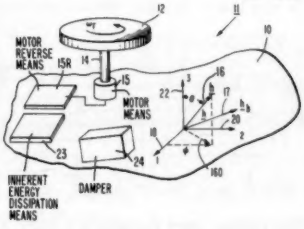
means coupled to the fuel delivery conduit below said first valve for purging the conduit of fuel with a metered quantity of inert gas after the fuel flow is shut off.

4,275,861

ORIENTATION OF MOMENTUM STABILIZED VEHICLES

Carl H. Hubert, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 4, 1978, Ser. No. 931,172
Int. Cl.³ B64G *1/28, 1/38*
U.S. Cl. 244—165 **12 Claims**



1. A method of orienting a vehicle in inertial space from an initial orientation to a final desired orientation, said vehicle having three principal axes that are mutually orthogonal, wherein one of said principal axes defines the maximum moment of inertia axis of said vehicle, said vehicle further having a total angular momentum the vector of which being essentially constant in inertial space, said maximum moment of inertia axis not being initially in alignment with said vector of the total angular momentum of said vehicle and said vehicle having a platform and a rotor adapted for rotation about a preselected axis on said platform, which preselected axis is fixed relative to said platform, said preselected axis having an initial axial orientation relative to inertial space which is different by a certain angle from a desired final axial orientation, said final desired orientation being parallel to the total angular momentum vector, comprising the steps of:

rotating said rotor to a constant rate of rotation such that the platform rotates in a given direction and rate of rotation, said constant rate of rotation of said rotor selected to produce a unique minimum of kinetic energy due to platform rotation at said desired orientation;

said unique minimum of kinetic energy defining an energy state wherein no other minimum of kinetic energy due to platform rotation exists for said constant rate of rotation; and

dissipating rotational kinetic energy on the platform of said vehicle at a rate greater than the rate of energy dissipation of said rotor;

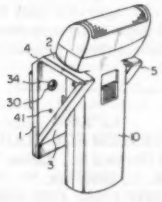
whereby as the energy of said platform is dissipated at a greater rate than the energy dissipated by said rotor, said rotor axis converges to said final desired orientation in which the axis of rotation of said rotor coincides with the total angular momentum vector and said vehicle is momentum stabilized.

4,275,862

WALL HANGING HOLDER FOR ELECTRIC SHAVER

Takeshi Takagi, Kadoma, and Tokushi Abo, Ashiya, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jul. 5, 1979, Ser. No. 55,072
Claims priority, application Japan, Jul. 4, 1978, 53-81776
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—205 A **8 Claims**

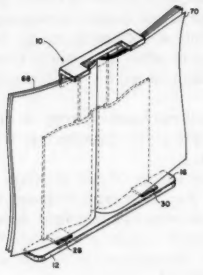


1. A wall hanging holder for electric shaver substantially comprising a fixing plate part for fixing on its one surface said holder to a wall surface or the like, a holding plate part having a hole for holding the shaver, and a bracing plate part for bracing said holding plate part in its position for holding the shaver, said fixing, holding and bracing plate parts being formed with a synthetic resin material into an integral plate in which a first hinge part connects an end of the fixing plate part to an end of the holding plate part foldably in longitudinal direction of said integral plate and a second hinge part connects also foldably the other end of the holding plate part to an end of the bracing plate part so that when the integral plate is bent at said first and second hinge parts the respective plate parts form a right-angled triangle with the holding plate part braced at right angles with respect to the fixing plate part by the bracing plate part, said fixing plate part having means for securing the other end of the bracing plate part at its position of said right-angled triangle, and said bracing plate part having an aperture for enclosing therein a body part of the shaver extending from a shaving head part of the shaver placed above the holding plate part as held in said holding hole thereof.

4,275,863
BOCK HOLDER

Don A. Hartman, 4715 SE. Adam-Apt. 936A, Bartlesville, Okla. 74003

Filed Jan. 2, 1979, Ser. No. 428
Int. Cl.[3] A47B 97/04
U.S. Cl. 248—448 4 Claims

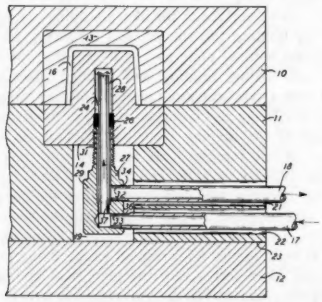


1. A book holder comprising:
a horizontally disposed elongated base plate having front and rear edges;
a horizontally disposed elongated top plate having front and rear edges spaced above the base plate;
a frame secured between the rear edges of the base plate and the top plate said frame including means to vertically adjust the top plate with respect to the base plate; and
a first pair of spaced apart upwardly facing friction pad members secured to the upper surface of the base plate and extending slightly above the base plate upper surface, and a second pair of spaced apart downwardly facing friction pad members secured to the lower surface of the top plate and extending slightly below the top plate lower surface, the top plate pad members being spaced closer together than the base plate pad members to facilitate manipulation of the pages of a book from the upper corners thereof, said pages being supported substantially only on said pad members thereby reducing drag when said pages are turned.

4,275,864
METHOD AND SYSTEM FOR COOLING A MOLD

Les W. Richards, 826 Orchard St., Racine, Wis. 53405

Filed Jun. 12, 1980, Ser. No. 158,726
Int. Cl.[3] B29F 1/022, 1/08; B99C 1/06
U.S. Cl. 249—79 5 Claims



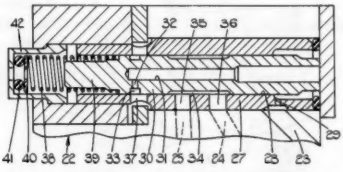
1. In a mold cooling system of the type having a mold with an interior threaded opening and a contiguous chamber, and having liquid flow connectors disposed in said chamber and threaded into said opening for the flow of cooling liquid to and from said mold opening, and said mold having two elongate passageways extending transverse to the axis of said mold threaded opening and into said mold chamber, and having a liquid flow tube extending in each of said mold passageways and threaded into one of said connectors for the flow of liquid to and from said mold opening, the improvement comprising said flow connectors including a one-piece junction disposed in said mold chamber and having a threaded stem extending integral on said junction for fluid tightly threading into said mold opening and directing cooling liquid into said mold opening, said one-piece junction including two threaded openings with the axes thereof transverse the axis of said threaded stem for threaded connection with said tubes, said mold opening and said stem having mating tapered threading and said stem also having threads of a maximum pitch diameter the same as the maximum size of those of said opening, said threaded stem having a threaded length extending into said mold opening to be liquid tight therein while said junction two threaded openings are axially aligned with said mold passageways.

4. In a method of cooling a mold through the steps of introducing a coolant into an opening in a mold by means of liquid flow connectors disposed in said opening and threaded therein and disposed in a chamber contiguous to said opening, and by means of positioning two flow tubes in two passageways extending in the mold to said chamber and then connecting the two flow tubes with the flow connectors, the improvement comprising providing a one-piece junction to serve as some of said flow connectors and having an integral threaded stem thereon and having two threaded openings with the axes thereof transverse to the elongate axis of said threaded stem, removing the extending end of said stem and forming tapered threads on the remaining end of said stem and to a thread size to be fluid tight in said opening, the remaining length of said stem being sufficient to have said stem fluid tightly threaded into said opening while the remainder of said junction is in said chamber and said two threaded openings are axially aligned with said two passageways, and connecting said two tubes to said two threaded openings.

4,275,865
FLUID CONTROL VALVES

Ronald F. Turner, London, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Oct. 19, 1977, Ser. No. 843,453
Claims priority, application United Kingdom, Aug. 24, 1977, 35600/77
Int. Cl.[3] F16K 31/122; F02N 17/00
U.S. Cl. 251—63 1 Claim



1. A fluid control valve comprising a body, a bore in the body, a valve member slidable in the bore, a coiled compression spring acting upon one end of the valve member, an opening into said bore whereby in use, fluid pressure can be applied to the valve member to move same in the bore against the action of the coiled spring from an inoperative position to an operative position when a predetermined fluid pressure is attained, a resilient member formed from elastomeric material located in an end of the bore, an abutment member located against said resilient member, the other end of said coiled compression spring engaging with said abutment member, said valve member including a portion extending concentrically into said compression spring and engaging said abutment mem-

ber when said valve member attains said operative position, the engagement of said portion with said abutment member acting to limit the compression of said coiled compression spring, said resilient member being stressed to allow said valve member to move an additional amount when the fluid pressure increases further, said resilient member acting when the fluid pressure falls, to impart initial movement of the valve member towards the inoperative position.

4,275,866

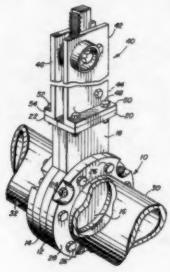
OPERATOR FOR A GATE VALVE

Dwight W. Jamar, Hibbing, Minn., assignor to Newcon Company, Tempe, Ariz.

Filed Mar. 27, 1980, Ser. No. 134,509

Int. Cl.³ F16K *31/54*

U.S. Cl. 251—250 **4 Claims**



1. An unenclosed operator for a gate translatable within the chest of a gate valve to open and close the gate valve by imparting translatory motion to the gate, said operator comprising in combination:

(a) a non-enclosed pedestal mounted upon and extending from the chest of the gate valve and in general alignment with the rectilinear translatory motion of the gate, said pedestal comprising a pair of spaced apart legs located to straddle the gate;

(b) translatable rack means for imparting rectilinear motion to the gate in either of two opposed directions;

(c) rotatable means rotatably supported by said pedestal for engaging and translating said rack means, said rotatable means comprising a pinion gear, a shaft supporting said pinion gear and journals disposed in said pair of legs for journaling said shaft;

(d) bearing means disposed intermediate said pair of legs for maintaining said rack means in engagement with said pinion gear and for maintaining said pair of legs positionally spaced with respect to one another;

(e) said shaft including an end extending lateral to one leg of said pair of legs;

(f) means for disengageably engaging said shaft end with a special tool to impart rotary motion to said shaft; and

(g) shroud means for limiting access of other than the special tool to said shaft end.

4,275,867

VALVE ASSEMBLY AND METHOD

Petrus J. R. Schils, Breda, Netherlands, assignor to Keystone International, Inc., Houston, Tex.

Filed Mar. 17, 1978, Ser. No. 887,513

Claims priority, application Netherlands, Mar. 17, 1977, 7702881

Int. Cl.³ F16K *31/00*

U.S. Cl. 251—297 **15 Claims**

1. A disc-type valve assembly comprising:

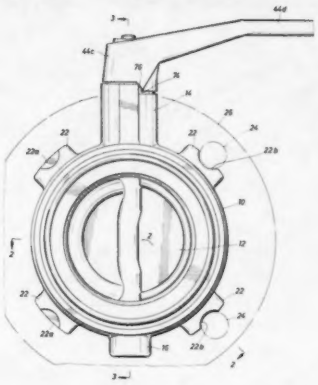
a tubular valve body having a flowway therethrough and a radial passageway communicating with said flowway;

a disc-like valve element disposed within said flowway;

a shaft member having one end directly rigidly connected to said valve element by a pre-stressed self-connection, member being rotatably mounted in said valve body

a handle connected to said shaft member whereby said handle and said shaft member form a rotating body, at least a portion of said handle being disposed outwardly of said valve body, and said rotating body being rotatably mounted in said radial passageway;

an integral positioning sleeve formed of resilient material interposed in tight, pre-stressed relation between said valve body and said rotating body in said radial passage-



way, said positioning sleeve and one of said bodies having interengaged retainer formations preventing relative rotation therebetween, and said positioning sleeve and the other of said bodies having interengageable radially projecting and receiving detent formations for preventing relative rotation between said positioning sleeve and said other body under torque loads below a pre-determined magnitude, the degree of resiliency of said positioning sleeve being substantially greater than those of said bodies whereby said positioning sleeve is deformable under torque loads greater than or equal to said magnitude to permit such rotation.

4,275,868

VALVE WITH BODY AND STEM OF PLASTIC MATERIAL

Jerry L. Crone, Paris, Ill., assignor to Unarco Industries, Inc., Chicago, Ill.

Continuation of Ser. No. 794,727, May 9, 1977, abandoned. This application Nov. 29, 1978, Ser. No. 964,618

Int. Cl.³ F16K *5/00*

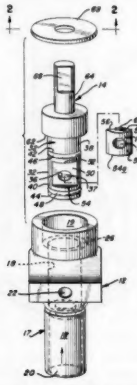
U.S. Cl. 251—310 **7 Claims**

1. In a two-element valve member for liquid under pressure that includes: a body member as one element with an elongated flow chamber therein; a rotatable controller member as the second element with an elongated cylindrical flow plug of a size adapted for positioning within said flow chamber; there being inlet and outlet flow openings including a lateral flow opening in said body member, and inlet and outlet flow openings including a lateral flow opening in said flow plug, such that the lateral flow openings of said plug and body member may be selectively positioned in a flow relationship or a no-flow relationship to each other, upon effecting rotational movement of the second element relative to said first element;

the improvement comprising, in combination: at least one of said members being formed of plastic; a pair of longitudinally spaced, cylindrical, circumferential lands defined on one of said members, a pair of longitudinally spaced circumferential seals being provided on the other member

and adapted for engagement with said lands, to provide spaced rotational seals, between said members in the flow chamber, located on opposite sides of said lateral flow openings and operative to prevent leakage therepast of liquid under pressure;

a recess defined in the exterior of said rotatable cylindrical flow plug, said recess being of channel-shaped cross-section and extending chordally of the cylindrical flow plug with the web of the channel-shaped recess being flat and intersecting and completely surrounding a terminus of said lateral flow opening therein, a wiper seal positioned in said recess and being of a size and shape to provide a planar interior surface to engage said web of the channel-shaped recess in the flow plug to surround and bound said



terminus of said lateral opening in the flow plug and being of a dimension to sealingly engage both the portions of the recess that surround and define the terminus of the lateral flow opening in the flow plug and the annular wall portions of the cylindrical flow chamber that surround the lateral flow opening in said body member when the two said lateral flow passageways are aligned in a flow relationship, and to sealingly engage against an annular wall portion of the cylindrical flow chamber that is adjacent but circumferentially offset from the lateral flow opening in said body member when the two said lateral flow passageways are in a no-flow relationship, so that no flow will pass through the lateral flow openings in the flow plug and the body member.

4,275,869

AIR CUSHION LIFTING DEVICE

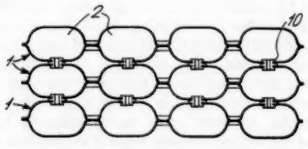
Harold J. Clements, Canterbury, England, assignor to Frank B. Dehn & Co., London, England

Filed Jan. 2, 1979, Ser. No. 518

Claims priority, application United Kingdom, Jan. 5, 1978, 377/78

Int. Cl.³ B66F 3/24

U.S. Cl. 254—89 H **5 Claims**



1. An air cushion lifting device comprising a plurality of layers of inflatable cushions, each layer comprising a plurality of inflatable compartments, and air supply means for supplying air to said compartments for enabling all of said compartments to be inflated substantially in concert, the compartments being interconnected in the vertical direction by restricted passages and so arranged that, in use, a load supported only on the device remains substantially stable as the device is inflated to elevate the load.

4,275,870

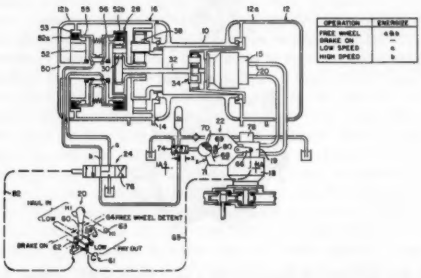
APPARATUS FOR CONTROLLING SPEED AND DIRECTION OF A VEHICULAR TOWING WINCH

Richard C. Henneman; Kenneth A. Burdon, both of Bellevue, and Joseph R. Bruce, Seattle, all of Wash., assignors to PACCAR Inc., Bellevue, Wash.

Division of Ser. No. 733,150, Oct. 18, 1976, Pat. No. 4,185,520. This application Sep. 24, 1979, Ser. No. 78,580

Int. Cl.³ B66D 1/08, 1/44

U.S. Cl. 254—361 **4 Claims**



1. A mechanical-fluid control mechanism for operating a hydraulically powered and operated winch in which the winch is powered by an hydraulic motor driven by an hydraulic pump and includes input and output power fluid lines to said motor, and the winch further has a fluid control circuit with two control fluid lines which when selectively energized will cause the winch to provide a variety of operating functions, the improvement comprising:

a manually positionable lever movable into low speed haul-in, low speed pay-out, high speed haul-in, high speed pay-out, brake-on and freewheel positions;

first valve means having a first valve core movable for energizing said two control fluid lines of said hydraulic operating circuit, first link means coupling said first valve core with said lever;

brake valve means in series with said first valve means in said hydraulic operating circuit and having a second valve core movable between a brake-on position blocking control fluid to said first valve core and a brake-off position directing control fluid to said first valve core, second link means coupled to said lever, and cam means operatively coupled to said second link means and to said second valve core for actuating said second valve core in response to movements of said second link;

winch power control means operatively controlling the power fluid within said motor input and outlet lines; and

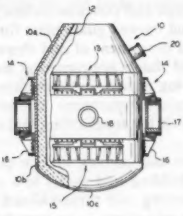
lost-motion linkage means coupled between said cam means and said winch power control means for actuating said winch power control means only after said cam means moves said second valve core to allow control fluid to pass to said first valve core, whereby the brake is unlocked prior to delivering power fluid to initiate one of said winch operating functions and is prevented from locking until the winch power control means returns the power fluid to a neutral non-flowing condition.

4,275,871

METALLURGICAL VESSEL AND SUPPORTING MEANS

Rashed N. Nagati, Mars, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Jul. 18, 1980, Ser. No. 169,965
Int. Cl.[3] C21C 5/46
U.S. Cl. 266—243 10 Claims



1. A metallurgical vessel having a longitudinal axis,
a trunnion support at least partially surrounding said vessel and having upper and lower surfaces,
upper and lower bracket means mounted on said vessel and being supported on the upper and lower surfaces of said trunnion support respectively,
said trunnion support being adopted to be tilted for tilting said vessel about a generally horizontal axis to permit molten metal to be discharged from said vessel, said bracket means supporting said vessel in its upright position and when tilted,
said vessel being subject to longitudinal and radial expansion and contraction relative to said trunnion support when molten metal is processed therein whereby the surface of said vessel adjacent the upper and lower surfaces of said trunnion support moves outwardly and away from said trunnion support surfaces at an inclined angle,
said lower bracket means engaging said trunnion support along a surface whose angle relative to a line normal to the longitudinal axis of said vessel is substantially equal to:

$$\tan^{-1}\left(\frac{\Delta H}{\Delta R_b}\right)$$

where:

$$\Delta H = H\left[B\left(\frac{Tst + Tsb}{2} - Ta\right) + \frac{2750 + N\left[180 + .82\left(\frac{Tst + Tsb}{2} - 455\right)\right]}{E}\right]$$

$$\Delta R_b = R_s\left[B(Tsb - Ta) + \frac{2416 + .697N[180 + .82\,(Tst - 455)]}{E}\right]$$

and where:

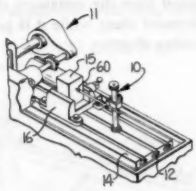
R_s = Initial outside radius of shell at room temp.	in.
ts = actual thickness of shell	in.
$N = \frac{Rs}{ts}$	
Tst = Temp. of shell at top brkt. during operation	°F.
Tsb = Temp. of shell at bottom brkt. during operation	°F.
E = Young's modulus of elasticity	Lbs/in.^{2}
B = Coeff. of linear therm. expansion of steel	in./(in. °F.)
H = Effective dist. between top and bottom sup. brkts.	in.
ΔRb = Radial displacement at bottom support bracket	in.
ΔH = Longit. displacement of shell between top and bottom brackets	in.
Ta = Ambient shop temp.	°F.

4,275,872

CLAMPING APPARATUS

Charles Mullis, Rte. 6, Box 603, Monroe, N.C. 28110

Filed Sep. 24, 1979, Ser. No. 78,226
Int. Cl.[3] B23Q 3/00
U.S. Cl. 269—72 8 Claims



1. An apparatus for selectively securing two members in a predetermined positional relationship, and characterized by the ability to permit the ready release and resecurement of the two members in a new positional relationship, and comprising
a generally U-shaped clamping block having a first opening extending therethrough at the bight of the U, a pair of parallel clamping arms formed by the free ends of the U, and a second opening extending transversely through said two arms in a direction generally perpendicular to the axis of said first opening,
a clamping member disposed through said second opening and having a head at one end, an externally threaded portion at the other end, a third opening extending transversely through said head, and an axially directed slot extending through said head and disposed to include the axis of said third opening,
a post received in said first opening,
means for releasably securing said post in an upright position to a slot in a supporting surface,
a rod received in said third opening,
a nut threadedly received on said threaded end of said clamping member, and
cooperating surface means on said clamping block and said clamping member for closing said slot and thereby clamping said rod in said third opening when the clamping member is drawn into the second opening by the tightening of said nut, and whereby the tightening of the nut serves to concurrently clamp the post in said first opening and said rod in said third opening.

4,275,873

PROCESS AND EQUIPMENT FOR THE OPENING OF FOLDED PROOF SHEETS

Horst Rathert, Minden, Fed. Rep. of Germany, assignor to Rahdener Maschinenfabrik August Kolbus, Wesphalia, Fed. Rep. of Germany

Filed Jun. 27, 1979, Ser. No. 52,684
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1978, 2829067
Int. Cl.[3] B65H 39/02
U.S. Cl. 270—54 15 Claims

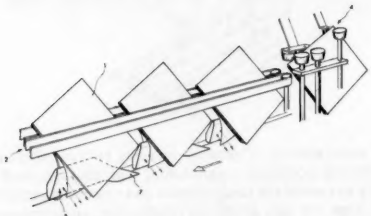
1. A method for serially separating the pages of signatures composed of folded rectangular sheets which have been stacked one within the other to form a substantially planar stack or sheets comprising the steps of:
preparing the stack for transport along a predetermined pathway by placing the stack of folded sheets in a generally vertical orientation substantially parallel to the direction of transport;
said preparing step further including the step of positioning one of the corners of the stack lower than the remaining corners;

transporting the rotated vertical stack of folded sheets along said predetermined pathway;

establishing pressurized gas streams at a plurality of spacially separated locations along the predetermined pathway, the gas streams being aimed so as to at least pass partly adjacent to said one corner of the stack of folded sheets;

conveying the vertical stack of folded sheets past a first gas stream whereby the flow of the first stream will produce a lifting force and the outermost sheet will be at least partially separated from the remaining sheets;

catching the outermost sheet while it is partially separated from the remaining sheets;



guiding the caught sheet away from the remaining sheets;

passing a second gas stream between the caught sheet and the remaining sheets whereby the flow of the second stream will produce a lifting force which will act upon the next outermost sheet in the stack;

repeating the steps performed on the first sheet on the second and subsequent sheets to serially separate sheets from the moving stack; and

removing the stack of sheets from the pathway once the desired number of sheets have been separated from the stack.

4,275,874

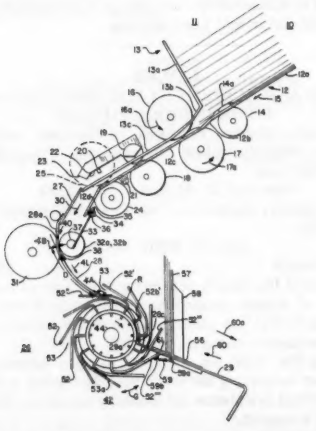
EXTENDED STACKER

John A. DiBlasio, Medford, N.J., assignor to Brandt-Pra, Inc., Cornwells Heights, Pa.

Filed Feb. 21, 1979, Ser. No. 13,558

Int. Cl.³ B65H *29/40, 31/14*

U.S. Cl. 271—4 **22 Claims**



18. Apparatus for turning and stacking sheets, comprising:

first accelerating means for receiving and accelerating sheets and for moving said sheets in a first direction to sheet-turning means;

said sheet-turning means including a first guide plate adapted to be engaged by said sheets for changing the direction of movement of said sheets to a second direction;

said sheet-turning means further including a curved guide plate having a concave surface portion and a convex surface portion and second accelerating means partially extending through said concave surface portion and cooperating with said curved guide plate for further changing the direction of movement of said sheets to a third direction so that said sheets are turned at least 90° relative to the sheets moving in said first direction;

said second accelerating means cooperating with said curved guide plate for accelerating said sheets in said third direction; and

means adjacent to said convex surface portion for loosely receiving and holding said sheets in a curved configuration and transferring said turned sheets to a stacker tray which supports said sheets in an upright fashion.

4,275,875

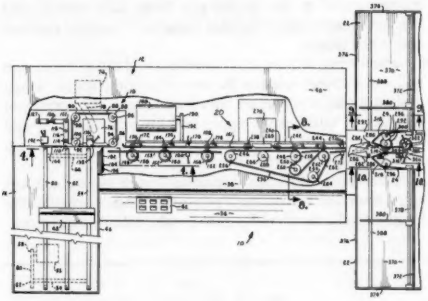
MAIL SORTING MACHINE

Roy Akers, Lafayette County, Mo., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 28, 1978, Ser. No. 973,926

Int. Cl.³ B65H *3/12, 31/06, 31/24*

U.S. Cl. 271—5 **4 Claims**



4. In a mail sorting apparatus of the type operable to sort a plurality of envelopes in accordance with an indicator thereon, the improvement therein of a storage bin comprising

a floor surface;

a side retaining wall located adjacent to said floor surface and extending upwardly therefrom;

a movable means mounted relative to said floor for assisting in maintaining the envelopes stored in said bin in a preselected plane; and

a raised rib protruding upwardly from said floor surface in said storage bin and operable to orient said envelopes in said bin in an offset position so that simultaneous full edge contact with both the bin floor and the retaining wall is precluded.

4,275,876

ELECTROPHOTOGRAPHIC COPYING APPARATUS

Masaru Imaizumi, Shinshiro, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 16, 1979, Ser. No. 30,648

Claims priority, application Japan, Apr. 15, 1978, 53-50115[U]

Int. Cl.³ B65H *31/22, 31/00*

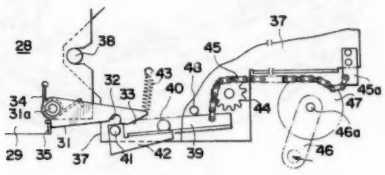
U.S. Cl. 271—8 R **18 Claims**

18. An electrophotographic copying apparatus which comprises:

a body proper and a copy paper transporting unit which

cooperate with each other to provide a path for a copy paper through said apparatus, said body proper including a copy paper storing means provided with a feeding means for feeding said copy paper into said apparatus, said path extending from immediately in front of said feeding means to a discharge end in said transporting unit, said transporting unit being mounted in said body proper for partial withdrawal from said body proper in the direction of feeding of said copy paper;

a first locking means on said body proper;



a second locking means on said transporting unit and being releasably engagable with said first locking means;

a rotatable means provided on said body proper at a position vicinal to said discharge end; and

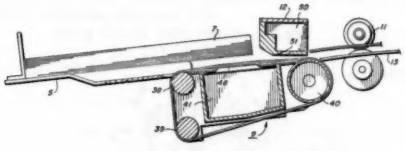
a flexible transmitting means cooperating with said rotatable means and connected to said second locking means to release said second locking means from engagement with said first locking means and withdraw said transporting unit from said body proper as said rotatable means is rotated in a single continuous action.

4,275,877

INTERRUPTED JET AIR KNIFE FOR SHEET SEPARATOR

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 3, 1979, Ser. No. 81,592
Int. Cl.³ B65H *3/12, 3/48*
U.S. Cl. 271—166 **2 Claims**



1. A bottom sheet separator-feeder for separating and forwarding sheets seriatim comprising;

a stack tray adapted for supporting a stack of sheets to be fed, said tray having a depressed pocket formed therein so that the major portion of the stack weight is supported by the edge portions of said pocket to provide a seal between the sheets and the edge portions of said pocket;

vacuum feed means disposed beneath said tray adapted to pull the bottom sheet in the stack into said pocket and feed the sheet from beneath the sheet stack; and,

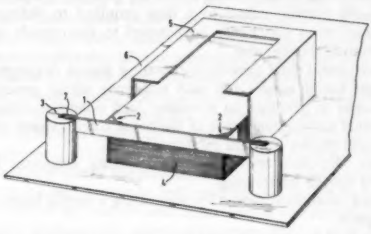
an air knife disposed adjacent the front of said tray to inject air between the bottom sheet in the stack on said tray and between adjacent sheets in the stack, said air knife having a plurality of spaced discharge orifices therein, movement of the bottom sheet in the stack into said pocket by said vacuum feed means causing a pocket shaped depression in the bottom sheet, thereby providing a space between the bottom sheet and the remainder of the stack for injecting air therein from said air knife, the plurality of discharge orifices in said air knife providing a plurality of diverging and expanding air streams to induce velocity and pressure gradients in the space between the bottom sheet and the remainder of the stack above said pocket to provide optimized air flow over the top of the bottom sheet for supporting the remainder of the stack spaced from the bottom sheet.

4,275,878

DEVICE FOR SEPARATING SHEETS

Klaus-Jörg Ruschepaul, Hattersheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 15, 1979, Ser. No. 84,547
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1978, 2845962
Int. Cl.³ B65H *3/56*
U.S. Cl. 271—170 **10 Claims**



1. A device for separating sheets from a stack of sheets, comprising:

a base for supporting the stack of sheets;

a bar extending transversely along one edge of the stack of sheets;

two members attached to said bar at a distance from one another corresponding to the width of the sheets for holding down the corners of the sheets;

two guide elements mounted on said base on opposing sides of the stack of sheets for vertically displaceably receiving said bar and guiding said bar along a vertical path; and

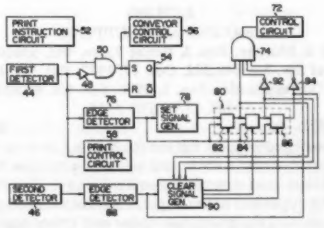
wherein each of said corner hold-down members comprises two angle sides forming an angular separating corner and a diagonal brace extending transversely to the angle sides.

4,275,879

ABNORMAL FEED CONDITION-DETECTING APPARATUS FOR A PRINTING DEVICE

Mitsuo Yamashita, Tokyo, and Osamu Kondo, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 3, 1979, Ser. No. 81,556
Int. Cl.³ B65H *43/08, 43/02*
U.S. Cl. 271—259 **4 Claims**



1. An abnormal feed condition-detecting apparatus for a printing device comprising:

record instruction means for generating a record instruction signal;

paper feed means connected to said record instruction means to send out papers one by one according to said record instruction signal;

conveying means provided adjacent to said paper feed means and extending so as to convey the paper from said feed means to the outside of the printing device;

detecting means provided on one end of said conveying means which is near to said paper feed means to generate a detection signal according to the passage of the paper;

image forming means disposed adjacent to said conveying means to form an image on the paper being conveyed according to the detection signal of said detecting means;

count means connected to said record instruction means and detecting means to count a time from the generation of the record instruction signal to the generation of the detection signal;

reference signal generating means for generating a reference signal corresponding to a time required to deliver the paper from said paper feed means to the outside of the printing device; and

an abnormal feed condition-detecting means connected to said count means and said reference signal generating means to generate an abnormal feed condition-detecting signal upon coincidence of the count output signal of said count means and said reference signal.

3. An abnormal feed condition-detecting apparatus for a printing device comprising:

record instruction means for generating a record instruction signal;

paper feed means connected to said record instruction means to send out papers one by one according to the record instruction signal;

conveying means provided adjacent to said paper feed means and extending so as to convey the paper from said feed means to the outside of the printing device;

first detecting means provided on one end of said conveying means which is near to said paper feed means to generate a first detection signal according to the passage of the paper;

image forming means disposed adjacent to said conveying means to form an image on a conveying paper according to the detection signal of said detecting means;

second detecting means provided on the other end of said conveying means which is near to the outside of the printing device to generate a second detection signal according to the passage of the paper;

means, connected to said first and second detecting means, for monitoring the number of papers on said conveying means according to the first and second detection signals and for generating a third detection signal when the number of conveying papers is decreased by one; and

abnormal feed condition-detecting means connected to said record instruction means and monitoring means to generate an abnormal feed condition-detecting signal upon coincidence of said record instruction signal, said second detection signal and said third detection signal.

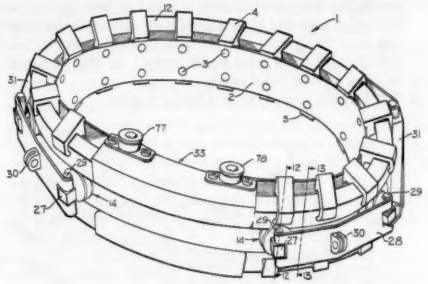
4,275,880

BEARING AND SUPPORT

Raymond J. Murphy, Rte. 2, Bonne Terre, Mo. 63020

Division of Ser. No. 842,532, Oct. 17, 1977, Pat. No. 4,204,719.
This application Jun. 1, 1979, Ser. No. 44,637
Int. Cl.[3] A63B *5/16*
U.S. Cl. 272—93 **26 Claims**

1. A bearinged support for use for holding an item such as a gymnast comprising a structural member provided for encircling said item, said structural member being resiliently flexible and having upper and lower edges, a series of keepers provided spacedly around the proximate upper and lower edges of said structural member, a pair of races, one of each race being held by the keepers associated with the respective upper and lower member edges, at least a pair of bearings operatively associated with the races of said support, each bearing comprising a pair of rotatable members forming a peripheral configuration engageable with the upper and lower races, each pair of members being rotatable about a common axis and capable of simultaneously turning in opposite directions, a shaft having the mem-



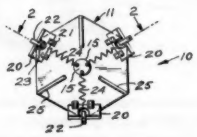
bers rotatably mounted thereon providing a common axis about which the said members turn, and bearing means arranged intermediate the rotatable members and their shaft to facilitate the turning of said members therearound.

4,275,881

TILT POLE

W. Ted Armstrong, P.O. Box 40962, San Francisco, Calif. 94140

Filed Sep. 4, 1979, Ser. No. 71,832
Int. Cl.[3] A63B *25/04;* A63G *31/08*
U.S. Cl. 272—114 **3 Claims**

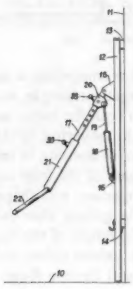


1. A tilt pole device, comprising, in combination, a flat base, a plurality of legs with wheels that are three in number, are equally and radially spaced apart from the vertical center axis through the top and underside faces of said flat base, said legs with wheels being in engagement with the ground at one end and are hinged to the underside of said flat base at their opposite ends by a hinge, and are urged inwards toward said vertical axis in said flat base by spring means, said spring means providing the shifting of said flat base from its horizontal plane, when the user mounted upon said flat base imparts a rocking motion to said flat base omnidirectionally by shifting their weight similarly, while gripping a pole fixedly secured at its lower portion to said flat base.

4,275,882
HOME EXERCISE GYM

Richard W. Grosser, Boone, and Virgil L. Long, Sr., Jefferson, both of Iowa, assignors to AMF Incorporated, White Plains, N.Y.

Filed Mar. 27, 1980, Ser. No. 134,720
Int. Cl.³ A63B *21/08, 23/02*
U.S. Cl. 272—117 **4 Claims**

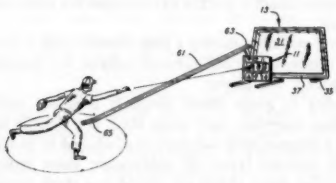


1. An exercise device comprising a vertical frame, a manually operable exercise lever pivoted at its inner end to said frame, a piston-cylinder hydraulic type shock absorber having a pivot connection at one of its ends to said frame and at its other end to said lever, means for adjusting said other end pivot connection along the length of said lever to vary the resistive force of said shock absorber to movement of said lever, and said one end pivot connection being disengagable from said frame and a cradle on the said lever for retaining said shock absorber solely on said lever whereby said shock absorber operates as a dead weight resistive force to movement of said lever.

4,275,883
PITCHING TARGET WITH BALL RETURN

Anthony J. Grimaldi, 25 Mountain View Ave., Kingston, N.Y. 12401, and Anthony Fabiano, Kingston, N.Y., assignors to Anthony Grimaldi, Kingston, N.Y.

Filed Oct. 9, 1979, Ser. No. 82,694
Int. Cl.³ A63B *61/00*
U.S. Cl. 273—26 A **2 Claims**



1. A pitching target with ball return for practice by a pitcher in pitching baseballs comprising:

a vertically-oriented pitching indicator including a frame and three horizontal cords all located within the same plane and mounted on the frame, said frame being adjustable in height to relocate separately the height of each horizontal cord;

three flaps hung on each of the three horizontal cords, each group of three flaps including a left flap, a right flap and a center flap, each center flap being located between the right and left flaps, all of the right flaps being vertically aligned with one another, all of the center flaps being vertically aligned with one another, all of the left flaps being vertically aligned with one another, all of the left and right flaps having substantially the same area, all of the center flaps having substantially the same area and being larger in area than the left and right flaps, all of the center and left and right flaps having the same vertical dimension;

a backstop including a frame with a canvass mounted therein, said backstop being substantially parallel to and spaced from said pitching indicator, said backstop having a lower edge and two side edges;

a collecting trough including a concave elongated member located adjacent the lower edge of said backstop toward said indicator screen and adapted to receive baseballs hitting said backstop, said collecting trough being inclined toward one side edge of said backstop;

a conveyor means having an upper end and a lower end, said lower end of said conveyor means being located adjacent the lower end of said collecting trough, said conveyor means including a conveyor belt mounted on an upper pulley and a lower pulley, said upper pulley being located substantially above said lower pulley, said conveyor belt having a plurality of cups mounted thereon and adapted to receive baseballs from the collecting trough, said conveyor means being inclined at an angle from the vertical;

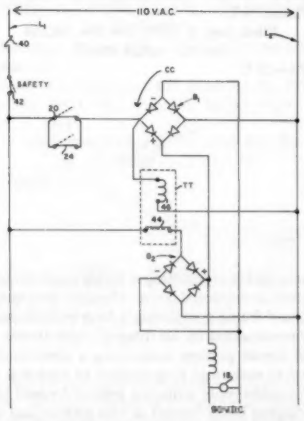
a motor means for driving said conveyor means; and

a return trough having an upper end and a lower end, said upper end being located adjacent to the upper end of said conveyor means and adapted to receive baseballs from the cups on the conveyor belt, said return trough being extended to the pitcher, said upper end of said return trough being substantially above said lower end of said return trough.

4,275,884
METHOD AND APPARATUS FOR PERIODIC PARTIAL DEACTIVATION OF AN AUTOMATIC PINSETTER

Ronald L. Smith, Boulder, Colo., assignor to Century International Corp., Denver, Colo.

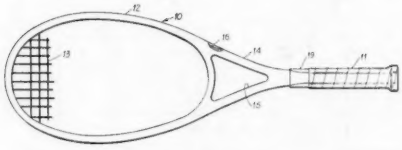
Filed Jan. 16, 1978, Ser. No. 869,800
Int. Cl.³ A63D *5/00*
U.S. Cl. 273—43 A **10 Claims**



10. An improved method for use in periodically activating and selectively or temporarily deactivating the pin retrieval function of an automatic pinsetter device of the type having: a pin-raking function cyclically responsive to each ball thrown, a pin-storage function cyclically operable to load and place a full set of pins on the alley after each occurrence of a strike or completion of a bowled frame, drive means, and a normally disengaged magnetic clutch engageable to form an operative drive connection between said drive means and a pin retrieval subassembly which operates to accomplish the pin retrieval function; said improved method comprising:

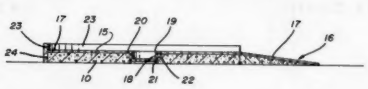
(1) providing a main current path and an alternate current path connected in parallel therewith, each connected to a source of electrical energy and each operatively connected in series with said magnetic clutch;
(2) providing a branch circuit path connected in series with said main current path and further connected between said main current path and said alternate current path;
(3) actuating said magnetic clutch into an energized and engaged position via the application of current through either of said main and said alternate current paths to thereby effect the instantaneous activation of the pin retrieval function;
(4) utilizing the pin-raking cycle and the pin-storage cycle operations to control the operation of said main current path;
(5) initiating the operation of the pin retrieval function simultaneously with the commencement of the pin-raking cycle by actuating said magnetic clutch into an energized and engaged position via said main current path;
(6) simultaneously energizing said branch circuit path and thereafter utilizing the said branch circuit path to establish and control the operation of said alternate current path;
(7) utilizing said alternate current path as a holding circuit for maintaining operative said pin retrieval function for a time interval following the opening of said main current path and the completion of both the pin-raking and pin-storage cycles of operation of said automatic pinsetter device; and,
(8) commencing said time interval at a time at which said main current path opens and continuing said time interval until the time at which said alternate current path opens whereupon the said alternate current path constituting said holding circuit becomes inoperative, to cease actuating said magnetic clutch to said energized and engaged position, and ceases to maintain operative said pin retrieval function.

4,275,885
TENNIS RACKET
John G. Howe, Boulder, Colo., assignor to AMF Incorporated, White Plains, N.Y.
Filed Aug. 6, 1979, Ser. No. 64,318
Int. Cl.³ A63B *49/02*
U.S. Cl. 273—73 C **1 Claim**



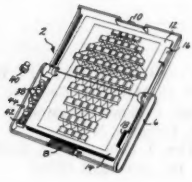
1. A tennis racket comprising a single piece unitary hollow tubular frame constructed from blended graphite-fiberglass composite, said frame comprising a loop portion and a handle portion interconnected by an integral open throat portion, a part of said throat portion comprising a continuation of said loop portion to make said loop portion an enclosed open loop, an outer circumferential stringing groove formed in said loop portion, stringing holes formed in said groove and throat portion part, tennis racket strings extending through said holes lengthwise and crosswise said enclosed open loop, all of said loop, handle and throat portions and said tennis strings being coplanar, said enclosed open loop having an oblong oval shape, said lengthwise strings being about 14" long and said crosswise strings being about 8" long whereby the ratio of the length to the width of the inner strung area of said oblong oval shape is about 1.75 to 1, and said strung area of said oblong oval shape comprising about half of the total length of said racket and said handle and throat portion together comprising the remaining other half of said racket.

4,275,886
GAME TARGET
Robert W. Bannon, 192 Afton Ave., Youngstown, Ohio 44512
Filed Sep. 7, 1979, Ser. No. 73,262
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—178 R **3 Claims**



1. A game target device comprising a soft flexible foam base with an elevated flat target surface, an access ramp and a thin soft smooth covering on both the target surface and the access ramp, means securing the covering to the target surface and the access ramp, a cut in an opening in said target surface and base, the soft flexible foam of the base arranged to resiliently mount the cup in said opening, a U-shaped soft flexible foam retaining wall of a height greater than the height of said base secured to the peripheral edges of the base from each end of said access ramp so as to extend above said target surface, said access ramp formed of soft flexible foam.

4,275,887
PORTABLE MULTIPLE GAME ASSEMBLY
Masanobu Tateyama, Matsudo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Oct. 5, 1979, Ser. No. 82,060
Int. Cl.³ A63F *3/00*; B42F *17/20*
U.S. Cl. 273—239 **10 Claims**



1. An approximately pocket size multiple toy game assembly comprising:
a housing assembly having a base member and a pivotal lid of a dimensional configuration suitable for portability in the pocket of a player;
a plurality of game sheets pivotally mounted within the housing assembly, each game sheet is a flexible laminate with a magnetizsole substrate sandwiched by nonmagnetizable exterior layers of appropriate game indicia, the respective game sheets are stored in a stack mode when the housing assembly is closed and at least one surface of each game sheet forms a portion of a game board;
means for selecting a particular game sheet including an exterior lever capable of being moved to a predetermined position adjacent appropriate indicia on the housing assembly;
means responsive to the position of the lever for securing at least one game sheet to the lid whereby the opening of the housing assembly automatically provides a game board formed from a pair of game sheets;
a plurality of game pieces containing magnets for adhesion to the magnetizable substrate; and
a storage box assembly mounted on the base member adjacent one side of the stacked game sheets for holding the game pieces.

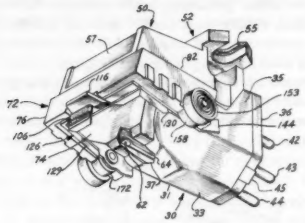
4,275,888
STABILIZING AND STATIC REMOVING ATTACHMENT FOR PHONOGRAPH PICKUP CARTRIDGE

Carl R. Anderson, Willmette; James J. Wellwood, Elmhurst, and Lawrence R. Happ, Mundelein, all of Ill., assignors to Shure Brothers, Inc., Evanston, Ill.

Continuation of Ser. No. 874,055, Feb. 1, 1978, abandoned. This application Oct. 30, 1979, Ser. No. 89,377

Int. Cl.³ G11B *3/58*

U.S. Cl. 369—74 **18 Claims**



1. An attachment for damping the low frequency tracking resonance of a stylus carried by a stylus support means capable of biasing the stylus into engagement with the grooves located on the planar surface of a rotating phonograph disc recording by the application of a predetermined tracking force to the stylus, said attachment comprising:

brush means having sufficient stiffness to engage the recording disc grooves as said disc is rotated and being fabricated at least in part from bristles having free ends capable of extending into the disc grooves for following the disc grooves as said disc is rotated;

biasing means suitable for causing the brush means to be biased toward the disc with a bias force less than the predetermined tracking force and greater than the minimum force needed to cause the brush means to follow warps of the disc surface; and

stabilizing means for coupling the stylus support means to the brush means through a predetermined mechanical resistance capable of damping vibrations occuring perpendicular to the planar surface of the disc whereby low frequency tracking resonance of the stylus caused by vibrations of the stylus support means perpendicular to the planar surface of the disc can be damped, said stabilizing means comprising bearing means for coupling the brush means to the stylus support means, said bearing means defining an axis of rotation and comprising cylindrical comating bearing surfaces which move relative to each other in a direction parallel to the axis of rotation whereby the vibrations parallel to the surface of the disc recording are damped, and a viscous fluid for damping the movement of the bearing means, said viscous fluid extending between the bearing surfaces, whereby the mechanical resistance of the bearing means is maintained constant throughout any degree of rotation of the bearing means.

9. An attachment for removing static electricity from a disc recording as the grooves of the disc are being engaged by a phonograph cartridge containing an electrical transducing coil connected to signal ground through a conductor, said attachment comprising:

a brush fabricated at least in part from carbon bristles having free ends capable of engaging the inside of the disc grooves;

biasing means suitable for causing the brush to be biased toward the disc with a predetermined force; and

means for electrically connecting the brush to the conductor, said means for electrically connecting including bearing means operatively connected to the cartridge, said bearing means containing a conductive silicon fluid, whereby the movement of the cartridge relative to the disc is damped and whereby the static electricity is removed from the grooves.

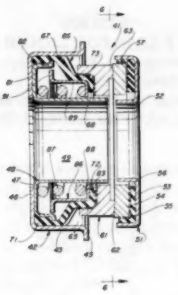
4,275,889
SEAL CONSTRUCTION

Gordon K. Butler, Columbus, and Robert T. Jefferson, Crothersvill, both of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Continuation of Ser. No. 894,121, Apr. 6, 1978, abandoned. This application Oct. 11, 1979, Ser. No. 83,684

Int. Cl.³ F16J *15/36*

U.S. Cl. 277—42 **29 Claims**



1. In a seal including a stationary first part and a second part subjected to rotational torques, the improvement of a bellows comprising a fixed end secured to said first part and a movable end secured to said second part, a central section connecting said fixed and movable ends, said ends and said central section being generally annular, and a plurality of ribs formed on said central section and extending generally tangentially between said fixed and movable ends.

4,275,890
SEAL WITH STIFFENED FORCE-TRANSMITTING PORTION

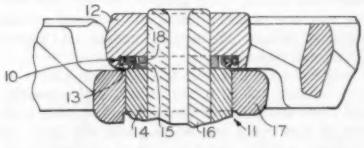
Harold L. Reinsma, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US 79/00505, § 371 Date Jul. 16, 1979, § 102(e) Date Jul. 16, 1979, PCT Pub No. WO81/00293, PCT Pub Date Feb. 5, 1981

This PCT application filed Jul. 16, 1979, Ser. No. 98,147

Int. Cl.³ F16J *15/32, 15/34*

U.S. Cl. 277—84 **29 Claims**



1. In a joint **(11)** having a first member **(12)** defining a cylindrical axially outwardly opening recess **(13)** having an end wall **(8)** and an axially extending circumferential wall **(9)**, a second member **(14)** adjacent said first member and defining a sealing surface **(15)** confronting said recess, said members being associated to have relative rotational movement about the axis of the recess and relative axial movement toward and from each other, an improved sealing structure **(10,110)** in said recess for movably sealing said members, comprising:

an annular seal **(19,119)** having a radially outer base portion **(20,120)** received coaxially in said recess **(13)**, an annular sealing portion **(21,121)** defining a lip **(22,122)** sealingly engaging said confronting sealing surface **(15)**, and a flexible connecting portion **(23,123)** extending between said

base portion (20,120) and sealing portion (21,121) for movably supporting said sealing portion;

an annular rigid stiffener (31,131) coaxially in said seal sealing portion (21,121) and having a projecting portion (30,130) extending inwardly away from said confronting sealing surface (15); and

spring means (24,124) coaxially in said recess and acting between said first member and said stiffener projecting portion to urge said lip into maintained movable sealed engagement with said confronting surface while sumultaneously permitting relative axial movement between said members.

4,275,891

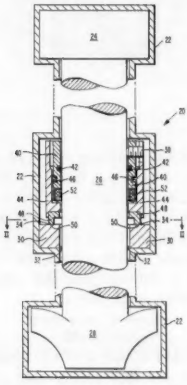
FACE TYPE SHAFT SEAL FOR LIQUID METAL PUMPS

David J. Boes, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 14, 1979, Ser. No. 66,370

Int. Cl.³ F16J *15/34, 15/40*

U.S. Cl. 277—96.1 **7 Claims**



1. A liquid metal pump comprising:

a housing;

a motor enclosed within said housing;

a pump shaft connected at one end to said motor;

an impeller connected to the other end of said pump shaft for circulating a liquid metal under the action of said motor;

a seal assembly mounted on said pump shaft;

a seal ring having a first seal face with a layer of gold plated thereon and having spiral grooves therein, said seal ring being mounted in said housing and disposed around said pump shaft defining an annulus between said pump shaft and said seal rings; and

a seal runner having a second seal face with a layer of gold plated thereon and attached to said seal assembly, said liquid metal being forced through said annulus under the action of said pump and wetting said seal faces thereby preventing metal-to-metal contact of said seal faces.

4,275,892

FORCE-BALANCED LATHE CHUCK WITH SAFETY RING

Günter H. Rohm, Heinrich-Röhm-Strasse 50, 7927 Sontheim, Fed. Rep. of Germany

Filed May 18, 1979, Ser. No. 40,271

Claims priority, application Fed. Rep. of Germany, May 19, 1978, 2821849

Int. Cl.³ B23B *31/14*

U.S. Cl. 279—1 C **10 Claims**

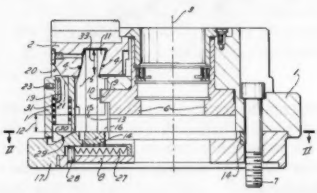
1. A lathe chuck comprising:

a chuck body rotatable about a chuck axis;

a plurality of angularly spaced and radially displaceable jaws on said body each formed with an axially backwardly open jaw recess having at least one side inclined to said axis;

means including respective jaw actuators axially displaceable in said chuck body and having inclined end portions engageable in said recesses for inward radial displacement of said jaws on displacement of said actuators axially forwardly toward axially advanced positions and for outward radial displacement of said jaws on displacement of said actuators axially backwardly toward partially axially retracted positions, each actuator further being displaceable axially backwardly into an axially fully retracted position out of engagement with the respective jaw, said actuators engaging the respective jaws in and between said advanced and partially retracted positions;

respective weights radially displaceable on said chuck between inner and outer positions and through intermediate positions;



means including respective force-transmitting members engaged between said weights and the respective jaws for conversion of radially outwardly effective centrifugal forces of said weights into radially inwardly effective forces on the respective jaws, each force-transmitting member being displaceable between axially advanced and partially retracted positions engageable with the respective jaw and into a fully retracted position unengageable with the respective jaw; and

means including an element operatively engaging said members and actuators and displaceable on said chuck between a jaw-removal position in which said actuators and members can assume the respective fully retracted positions, and a use position for preventing said actuators and members from moving axially backwardly beyond the respective partially retracted positions into the respective fully retracted positions.

4,275,893

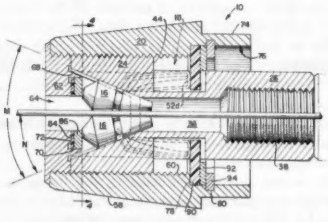
SELF-TIGHTENING KEYLESS CHUCK

Silvio G. Bilanceri, Owings Mills, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Aug. 31, 1979, Ser. No. 71,663

Int. Cl.³ B23B *31/19*

U.S. Cl. 279—64 **25 Claims**



1. A chuck for releasably gripping a tool bit or the like, said chuck comprising:

a chuck body axially extending along a chuck axis having an

internal opening formed therein, said opening being defined by a surface that includes a cam surface means thereon;

a plurality of gripping elements for gripping a tool bit located within said opening and movable relative to said cam surface means throughout a range of adjustment;

resilient urging means for resiliently urging said gripping elements against said cam surface means, said urging means including elongated urging members for each of said gripping elements, said urging members coupled at a forwardly facing first end to their respective gripping elements and extending in a rearwardly direction to a rearwardly facing second end; and

a control sleeve means adjustably mounted on said chuck for moving said gripping elements throughout said range of adjustment, said control sleeve means including a thrust receiving bearing surface for contacting said gripping elements and a retainer flange means spaced from said thrust receiving bearing surface for contacting said second ends of said urging members, said retainer flange means formed from at least two separable flange elements;

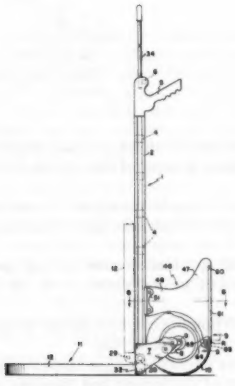
wherein adjustment of said control sleeve relative to said chuck body causes said gripping elements and said resilient urging means to move relative to said chuck body with said gripping elements moving relative to said cam surface means.

4,275,894

HAND TRUCK CONSTRUCTION ASSEMBLY

Carl N. Mortenson, Midland, Mich., assignor to Magline, Inc., Pinconning, Mich.

Filed Oct. 24, 1978, Ser. No. 954,307
Int. Cl.³ B62B *5/02, 1/00*
U.S. Cl. 280—5.24 **7 Claims**



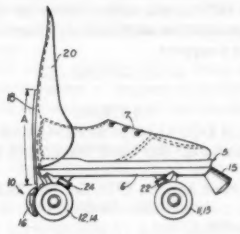
5. A hand truck construction comprising an upright frame member having upper, lower, forward and rearward ends; a load supporting nose member carried by said frame member adjacent its lower end; ground engaging wheels mounted on said frame member adjacent its lower end; a pair of body members each having a rearward surface and parallel grooves adjacent its rearward surface; means mounting each of said body members on said frame member adjacent opposite sides thereof with said body members extending rearwardly of said frame member; and a smooth surface wear strip fitted to each of said body members, each of said wear strips being C-shaped and having flanges which may be slid into the grooves of the associated body member, said grooves terminating at one end in an abutment.

4,275,895

ROLLER SKATE BRAKE

Jesse O. Edwards, 2927 W. Camile, Santa Ana, Calif. 92704

Filed Jan. 24, 1980, Ser. No. 115,103
Int. Cl.³ A63C *17/14*
U.S. Cl. 280—11.2 **6 Claims**



1. A roller skate brake apparatus adapted for attachment to the rear wheel truck of a roller skate for selectively applying frictional force to the surface of the rear wheels when a roller skater rotates his calf rearwardly to increase the angle between his leg and foot; the apparatus comprising:

a brake applicator adapted for location in close proximity to a roller skater's calf,

an elongated lever arm connected at its upper end to said brake applicator,

a fulcrum bracket partially rotatable about an axis of rotation that is parallel to the axle of said rear wheels and connected to the lower end of said lever arm,

a brake shoe in close proximity to said rear wheels and attached to said fulcrum bracket for rotation relative to said rear wheels about said axis, and

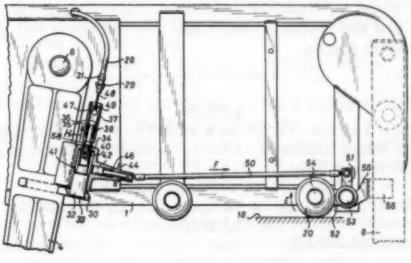
means for connecting said fulcrum bracket to said rear wheel truck for rotation of said bracket relative to said truck about said axis.

4,275,896

SAFETY MECHANISM FOR A CARRIAGE INSERTABLE INTO THE LOAD SPACE OF A VEHICLE

Josef Eicher, Eichholz 1108, 9436 Balgach, Switzerland

Continuation-in-part of Ser. No. 838,446, Oct. 3, 1977, Pat. No. 4,170,379. This application May 31, 1979, Ser. No. 44,083
Claims priority, application Switzerland, Jul. 10, 1976, 12738/76
Int. Cl.³ B62D *21/00*
U.S. Cl. 280—43.1 **6 Claims**



1. A safety mechanism for a carriage which is insertable into the load space of a vehicle, said carriage having arms **(4)** and wheels secured to said arms which are tiltable between operating and withdrawn positions, comprising arresting means **(30, 32)** operatively arranged for locking said arms in their operating position, and a safety device operatively arranged for

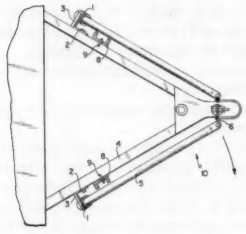
cooperation with said arresting means to prevent the unlocking of said arms when the arms are in their operating position, said safety device comprising roller means (20) movably secured to said carriage and located ahead of said arms, as viewed in the inserting direction, said safety device further comprising safety catch means (42) normally engaging said arresting means (30, 32), and means (50, 51, 52) operatively connecting said safety catch means (42) to said roller means for disengaging said safety catch means from said arresting means only if said roller means rest on a support.

4,275,897

TRAILER EQUALIZER SPRING BAR HOLDER

James E. Moyer, 5727 Rio Verde Way, North Highlands, Calif. 95660

Filed Apr. 11, 1979, Ser. No. 29,123
Int. Cl.³ B60D 1/14
U.S. Cl. 280—406 A **3 Claims**



1. A storage device for spring bars used on trailers comprising in combination:

a tube connected to a trailer tongue oriented to receive a first end portion of the spring bar

and a cutaway portion on an outer face of said tube away from the tongue so that the first end portion of the spring bar can be rotated and disposed within said cutaway portion

whereby two positions for the spring bar are provided:

a first temporary position when the spring bar is within said cutaway portion to allow the trailer to traverse steep grades,

and a second stowed and locked position for the spring bar when not in use wherein a second end portion of the spring bar is chained and locked to a hitch lock and the first end portion is within said tube and not in said cutaway portion.

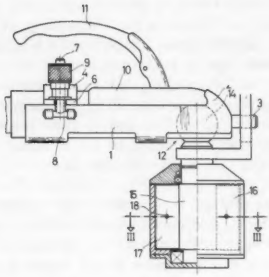
4,275,898

OSCILLATION ABSORBER FOR TRAILER HITCHES

Pedro Muste Llambrich, Avenida Generalisimo 73, Amposta (Tarragona), Spain

Filed Nov. 22, 1978, Ser. No. 963,154
Claims priority, application Spain, Nov. 22, 1977, 232.357
Int. Cl.³ B60D 1/06
U.S. Cl. 280—446 B **6 Claims**

1. An oscillation absorbing device for use in trailer hitches, comprising a ball connected to a rear support joined to a tractor; coupling means mounted on the trailer and arranged to turn around said ball, said coupling means including a receptor chamber for receiving said ball; a cover plate encompassing said receptor chamber, having a horizontal pivot connected thereto and pivotally arranged within a forked-shaped mounting member to permit free angular displacement of said cover plate around said horizontal pivot; damping means including



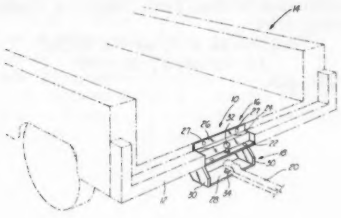
an axle connected to said ball; and said mounting member being secured to said axle.

4,275,899

HINGED BI-LEVEL HITCH FOR A VEHICLE

Verle L. Humphrey, Elkhart, Kans. 67950

Filed Aug. 17, 1979, Ser. No. 67,323
Int. Cl.³ B60D 1/06
U.S. Cl. 280—491 B **3 Claims**



1. A hinged bi-level hitch for a vehicle, the hitch adapted for receipt on a tubular bumper of the vehicle, the hitch comprising:

an upper hitch assembly integrally formed in the tubular bumper of the vehicle, the upper hitch assembly including:

a horizontal upper hitch plate having apertures therein and attached to and centered on the bottom of the bumper;

a pivot shaft housing centered on and integrally formed in the rear of the bumper; and

a vertical flat shield having apertures therein and attached to the top of the bumper and the pivot shaft housing;

a lower hitch assembly including:

a lower hitch plate; and

side plates attached to the ends of the lower hitch plate;

a pivot collar attached to the side plates;

a pivot shaft extending through the pivot collar, the ends of the pivot shaft attached to the bottom of the bumper, a portion of the pivot collar and pivot shaft received in the pivot shaft housing;

a first mounting bracket having apertures therein, the ends of the first mounting bracket attached to the front of the side plates, the first mounting bracket tangent with the bottom of the upper hitch plate when the lower hitch assembly is in a lowered position underneath the upper hitch plate, the apertures of the first mounting bracket indexed with the apertures in the upper hitch plate for receiving bolts there-

through and securing the lower hitch assembly below the upper hitch plate; and

a second mounting bracket having apertures therein and attached to the rear of the side plates, the second mounting bracket tangent with the vertical flat shield when the lower hitch assembly is in a raised position underneath the vehicle, the apertures of the second mounting bracket indexed with the apertures in the vertical flat shield for receiving bolts therethrough and securing the lower hitch assembly in a raised position underneath the vehicle.

4,275,900

FLUID SUSPENSION UNIT FOR MOTORCYCLES

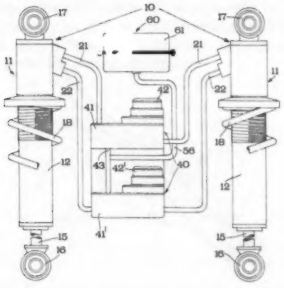
Angelo Andreoli, Via Omegna 20, Rivoli (To); Adolfo Boano, Corso Vercelli 122, 10155 Torino, and Mario Vesco, Corso Rosselli 111, 10129 Torino, all of Italy

Filed Aug. 30, 1978, Ser. No. 937,985

Claims priority, application Italy, Sep. 16, 1977, 69052 A/77

Int. Cl.³ B60G *15/06*

U.S. Cl. 280—710 **5 Claims**



1. A fluid compensation unit for motorcycles, particularly off-road motorcycles for cross-country sporting competitions and the like, usable both for the rear wheel and the front wheel of the motorcycle, comprising a pair of hydraulic shock absorbers for each wheel, each hydraulic shock absorber including an outer cylinder and an inner cylinder, defining an annular fluid chamber therebetween, a piston slidably mounted within and longitudinally of said inner cylinder, dividing said inner cylinder into a compression fluid chamber on one side of said piston and an expansion fluid chamber on the other side of said piston, duct means within said piston for for communication between said compression and expansion fluid chambers, means for communicating between said expansion fluid chamber and said annular fluid chamber, said piston having a piston rod connectable to a wheel supporting portion of the motorcycle, said outer cylinder being connectable with its end opposed to said piston rod to a fixed frame portion of the motorcycle; a pair of adjustable control valves connected in series by flexible pipes to said compression fluid chamber and through said annular fluid chamber to said expansion fluid chamber in said inner cylinder and a fluid pressure compensation tank connected by a flexible pipe to said pair of adjustable control valves.

4,275,901

INFLATABLE SAFETY BAG SYSTEM FOR VEHICLES

Motohiro Okada, Asaka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 20, 1979, Ser. No. 59,278

Claims priority, application Japan, Jul. 21, 1978, 53/89187; Jul. 24, 1978, 53/90291; Aug. 2, 1978, 53/94328

Int. Cl.³ B60R *21/02*

U.S. Cl. 280—741 **12 Claims**

1. An inflatable safety bag system for vehicles, comprising:

an electrical sensor for detecting a vehicle collision;

electrical actuator means;

a mechanical sensor for detecting a vehicle collision;

mechanical actuator means;

a mechanical valve opening device for a high-pressure gas container for filling gas in a safety bag;

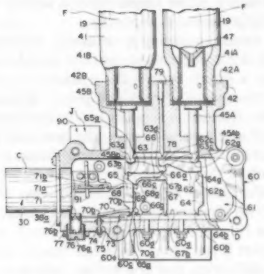
said electrical actuator means and said mechanical actuator means being operatively connected to said mechanical valve opening device, and being constructed to operate independently;

said mechanical valve opening device being actuatable to open said gas container in response to actuation of one of said electrical actuator means and said mechanical actuator means;

said electrical actuator means comprising a solenoid energizable by a collision detecting signal from said electrical sensor;

said solenoid comprising a movable member movable by a core which is energizable by a collision detecting signal from said electrical sensor, for actuating said valve opening device; and

said movable member comprising a disc-shaped body, a rod projecting centrally from the rear of said body for restricting said valve opening device, and a conical recessed portion at the rear of said body and at the base of said rod.



9. An inflatable safety bag system for vehicles, comprising:

an electrical sensor for detecting a vehicle collision;

electrical actuator means;

a mechanical sensor for detecting a vehicle collision;

mechanical actuator means;

a mechanical valve opening device for a high-pressure gas container for filling gas in a safety bag;

said electrical actuator means and said mechanical actuator means being operatively connected to said mechanical valve opening device, and being constructed to operate independently;

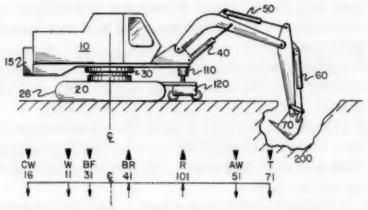
said mechanical valve opening device being actuatable to open said gas container in response to actuation of one of said electrical actuator means and said mechanical actuator means; and

resilient supporting means including a bimetal and supporting through a piece of a link mechanism a load applied on the sealing plate closing the opening of said high-pressure gas container, so that displacement of said resilient supporting means is sensed to detect a reduction in the gas pressure in said gas container.

4,275,902
CRANE OR EXCAVATOR WITH AUXILIARY MECHANISM FOR TRANSFERRING SUPERSTRUCTURE LOADS TO THE GROUND

Mohindar S. Teja, 2367 E. Larpenteur Ave., Apt. 110, St. Paul, Minn. 55109

Filed Aug. 24, 1979, Ser. No. 69,436
Int. Cl.[3] B66C 23/78
U.S. Cl. 280—766 10 Claims



1. In a vehicle comprising a ground engaging carrier frame, a superstructure, turntable means supporting said superstructure on said carrier frame for rotation about a vertical axis, and brace means offset from said turntable means to help support the superstructure and preclude tipping of said superstructure with respect to the ground, to in that manner prevent excessive unbalanced loading of the superstructure and/or the turntable means, the improvement comprising:

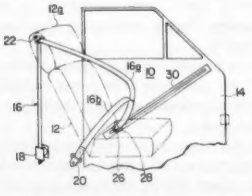
said brace means including a vertically oriented linear hydraulic motor comprising a cylinder attached to the superstructure, a piston within the cylinder, a piston rod extending downwardly from said piston through the lower end of the cylinder, a support pad at the lower end of the piston rod and a ground engaging secondary frame positioned outwardly of the main carrier frame and within the swing path of the linear hydraulic motor, whereby extension of the linear hydraulic motor into load applying contact with the secondary frame will result in a transfer of weight from the superstructure through the secondary frame, apart from the main carrier frame; and

means for delivering and controlling delivery of hydraulic fluid into and outfrom said cylinder to cause extension and retraction of the piston rod, or to hold the piston rod in a set position.

4,275,903
PASSIVE SEAT BELT ARRANGEMENT WITH WHEELED BELT CARRIER

Hideoki Matsuoka, Yokohama, and Yoshinobu Kondo, Kosai, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Fuji Kiko Company, Limited, Tokyo, both of, Japan

Filed Jul. 11, 1979, Ser. No. 56,600
Claims priority, application Japan, Jul. 19, 1978, 53-88017
Int. Cl.[3] B60R 21/10
U.S. Cl. 280—803 4 Claims

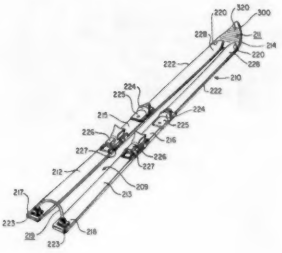


1. A passive seat belt arrangement in a motor vehicle having a door, comprising a seat belt, a track member mounted on an interior part of said vehicle and having a generally C-shaped cross section with a longitudinally extending slot thereof facing inboard of said vehicle and a belt carrying device longitudinally movably received in said tract member for carrying a portion of said seat belt so that movements of said belt carrying device in said track member in one and the other directions cause the seat belt to take easy-enter and occupant restraining positions, respectively, wherein said belt carrying device is provided with at least one cylindrical roller which runs in said track member by contacting only the peripheries of both of the circular edges thereof with the inside surface of said track member in a point contact manner upon longitudinal movement of said carrying device in and along said track member.

4,275,904
MONONOSE CONVERSION FOR TWINSKIS

Alec Pedersen, Vancouver, Canada, assignor to Pedersen Industries Ltd., Vancouver, Canada

Filed Jul. 21, 1978, Ser. No. 926,819
Int. Cl.[3] A63C 5/00, 11/00
U.S. Cl. 280—818 15 Claims



1. A tip structure for converting a pair of conventional skis into a twinski, said tip structure comprising: a mononose section including a trailing portion of essentially the total width selected for the width of the twinski and a leading portion converging forwardly in a generally curved nose; a right-hand pocket and a left-hand pocket separated by a central bridge section, the right-hand pocket having at least a lateral outside surface defined by a forward web section adapted to conform and butt against the outside edge of the tip of a conventional ski placed in said right-hand pocket, and having an inside edge of said central bridge section adapted to conform and butt against the inside edge of the tip of a conventional ski placed in said right-hand pocket; said left-hand pocket having at least a lateral outside surface defined by a forward web section adapted to conform and butt against the outside edge of the tip of a conventional ski placed in said left-hand pocket, and having an inside edge of said central bridge section adapted to conform and butt against the inside edge of the tip of a conventional ski placed in said left-hand pocket; and means, cooperating with and associated with said mononose and with said pair of conventional skis for clamping the tips of said conventional skis rigidly to said mononose.

4,275,905
PRESSURE-SENSITIVE RECORD MATERIAL

Robert E. Miller, Appleton, Wis., assignor to Appleton Papers Inc., Appleton, Wis.

Continuation-in-part of Ser. No. 375, Dec. 29, 1978, abandoned.
This application Jun. 5, 1979, Ser. No. 45,769
Int. Cl.[3] B41M 5/16, 5/22; C09D 11/00
U.S. Cl. 282—27.5 14 Claims

8. A pressure-sensitive record material which comprises a substrate coated with an encapsulated color-forming composition comprising:

(a) a colorless chromogenic color former other than Pyridyl Blue;
(b) an organic solvent for said chromogenic color former; and
(c) an additive for controlling CB decline selected from the group consisting of Pyridyl Blue in an amount of about 0.6 to about 1.7 parts by weight and a phenol having a free reactive position in an amount of about 2 to about 5 parts by weight, said parts by weight being based upon 100 parts by weight of total composition.

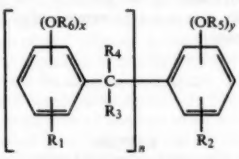
4,275,906

PRESSURE SENSITIVE RECORDING SHEETS

Grannis S. Johnson, Plainfield, and Ira M. Rose, Millburn, both of N.J., assignors to Diamond Shamrock Corporation, Dallas, Tex.

Filed Jul. 18, 1979, Ser. No. 58,563
Int. Cl.³ B41M *5/16, 5/22*
U.S. Cl. 282—27.5 **20 Claims**

12. In a pressure sensitive recording sheet assembly characterized by a more tolerable odor comprising a support having coated thereon a layer of color former dissolved in a solvent and a developer for said color former capable of developing color upon reacting with said color former, the improvement wherein said solvent comprises at least one alkoxy diphenyl alkane having the following structure:



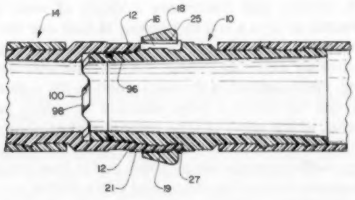
where R_1, R_2, R_3 and R_4 are H or a straight or branched chain alkyl group of 1 to 8 carbon atoms and can be the same or different; R_5 is a straight or branched chain alkyl group of 1 to 9 carbon atoms; R_6 is a straight or branched chain alkyl group of 1 to 8 carbon atoms; x is 0, 1 or 2; y is 1 or 2 and n is 1 or 2, with the proviso that the sum of the carbon atoms in R_1, R_2, R_3, R_4, R_5 and R_6 does not exceed 9 and with the further proviso that where said alkoxy diphenyl alkane is a solid to viscous liquid, at least one diluent or at least one other generally liquid solvent or mixture thereof is present.

4,275,907

QUICK CONNECTABLE COUPLING

Alexander C. Hunt, Santa Monica, Calif., assignor to Huntal Manufacturing Company Incorporated, Los Angeles, Calif.

Continuation-in-part of Ser. No. 729,689, Oct. 5, 1976, abandoned. This application May 16, 1978, Ser. No. 906,154
Int. Cl.³ F16L *37/28, 35/00*
U.S. Cl. 285—18 **10 Claims**



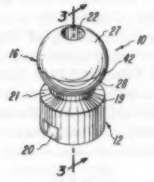
1. A coupling device for fluid conduits comprising a tubular male member and a female sleeve member adapted for connection to conduits, said male member having tapered means on its outer surface radially expanding along a generally longitudinal axis thereof, and shoulder means adjacent the rearward portion of said outer surface and extending radially inwardly therefrom, said members having means for positioning the same with the bores thereof in communication, resilient latching means on said female sleeve member adapted to be flexed radially outwardly by said tapered means and comprising radially inwardly directed lip means which snap behind said shoulder means when said members are positioned, at least one of said shoulder means and lip means making an obtuse angle with the longitudinal axis of its associated member such that axially directed pulling force will flex said resilient means of said female sleeve member outwardly to disengage said lip and shoulder means, locking ring means positioned around the outer surface of said female sleeve member and movable axially thereof by manual force into and out of a position maintaining said latching means in locking relationship to said shoulder means, and cooperating cam means on said male member and said female sleeve member whereby opposite rotation of said members relative to each other causes said cam means to axially displace said members and comprising cooperating slanted ramps formed on the inner end of said male member and on a contiguous portion of the inner surface of the bore of said female member.

4,275,908

FLUID COUPLING ASSEMBLY

Christopher W. Elkins, and David W. Smith, both of Ft. Collins, Colo., assignors to Teledyne Industries, Inc., Ft. Collins, Colo.

Continuation-in-part of Ser. No. 66,936, Aug. 16, 1979, abandoned. This application May 5, 1980, Ser. No. 146,456
Int. Cl.³ F16L *9/14*
U.S. Cl. 285—55 **38 Claims**



1. In a fluid coupler that includes:
a base including means for attachment to a supply pipe;
and an element coupled to said base and which constitutes the spherical portion of a ball joint;
the improvement comprising:
said element being composed of first and second mechanically-joined and contiguously mating approximately hemispherical segments;
means for securing said first segment to said base;
means, disposed entirely within the interior of said segments, for coupling said second segment to said base in establishment of said spherical portion unencumbered on its exterior;
and means defining a fluid flow channel through said base and said first and second segments.

4,275,909

FLEXIBLE PLASTIC PIPE JOINT

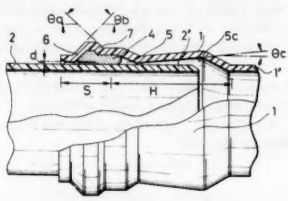
Tadao Yoshizawa, and Masayuki Sakaguchi, both of Sakai, Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Nov. 17, 1978, Ser. No. 961,558
Claims priority, application Japan, Nov. 22, 1977, 52-157237[U]
Int. Cl.³ F16L *17/00*
U.S. Cl. 285—110 **10 Claims**

1. A soft deformable synthetic resin pipe joint for telescopically connecting a synthetic resinous pipe to a pipe receiving socket comprising:

said socket including an end portion and a packing holding groove formed on an inner circumferential wall of said socket;

a packing member held in said groove of said pipe receiving socket and disposed so as to sealingly engage the pipe and the socket and to provide a gap between the inner circumferential portion of said end portion of said socket and the periphery of said pipe inserted therein wherein the outer periphery portion of the end of said pipe forms a chamfered portion, said packing member including a convex outer portion and an a radially inwardly extending compressible portion of smaller diameter than the outside diameter of said pipe;



a front radially outwardly flared and first and second radially inwardly flared rear inclined walls formed on the inner and outer periphery of said socket to define said groove, said front wall interconnecting with said first rear inclined wall;

said socket further comprising a supporting portion interconnecting said first and second rear inclined walls, said joint comprising a material of such softness and elasticity that upon external compression of each of said inclined walls, deformation expanding of the gap between said front and first rear walls occurs and inclined faces corresponding to said front and first rear inclined walls are formed on the backing member such that the axis of said pipe is substantially aligned with the axis of said joint upon flattening deformation of said joint.

4,275,910

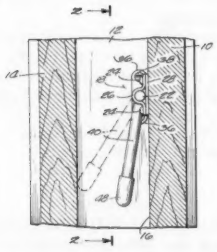
DOOR LATCH

Joseph D. Budish, 1635 Madison Ave., South Milwaukee, Wis. 53172

Continuation of Ser. No. 891,623, Mar. 30, 1978, abandoned. This application Apr. 12, 1979, Ser. No. 29,301

Int. Cl.³ E05C *5/02*

U.S. Cl. 292—57 **8 Claims**



1. A latch for a door installation including first and second doors mounted in spaced, facing relationship and for movement relative to each other between open and closed positions, said latch comprising

a support bracket including a base adapted to be mounted on the face of the first door between the first and second doors;

an elongated bolt having an outer end portion and carried by said support bracket for relative rotational movement and for relative slidable movement between a latching position wherein, when the first door is closed, said outer end portion is received in a keeper located adjacent the first door to prevent opening of the first door and an unlatched position wherein said outer end portion is retracted from the keeper to permit opening of the first door;

an elongated handle affixed on said bolt and extending transversely therefrom for rotating said bolt and for moving said bolt between the latching and unlatched positions, said handle having a length greater than the spacing between the first and second doors, and;

guide means on said support bracket for permitting reciprocal longitudinal movement of said bolt between the latching and unlatched positions when said handle is rotated to an operating position extending transversely of the plane of said base and generally perpendicular to the second door, said guide means including detent means for engageably receiving said handle and preventing longitudinal movement of said bolt from the latching position when said handle has been rotated to a non-operating position angularly displaced from the operating position whereby, during attempted rotational movement of said handle from a non-operating position to the operating position in a direction toward the second door with the second door closed, said handle engages the face of the second door to prevent movement of said handle to the operating position, thereby preventing movement of said bolt from the latching position.

4,275,911

SECURITY SEALS

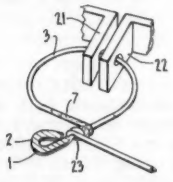
Henry L. Buckingham, 95 McDonald St., Mordialloc, 3195, Victoria, Australia

Filed Aug. 9, 1979, Ser. No. 65,061

Claims priority, application Australia, Aug. 16, 1978, PD5511[U]; Sep. 20, 1978, PD6034[U]

Int. Cl.³ B65D *33/34*

U.S. Cl. 292—315 **7 Claims**



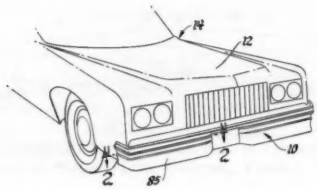
1. A security seal comprising a length of wire which is constructed to form a seal by twisting at least one end around the other end and wherein the seal is designed to result in fracture of the wire if an attempt is made to untwist said at least one end, characterized in the application to the region of said at least one end which is to be twisted of an orderly pattern of a material which results in the security seal exhibiting a perceivably different appearance if heat is applied to said region to render it sufficiently ductile such that said at least one end may be untwisted without fracturing, and said material also exhibiting a perceivably different appearance if mechanical work is performed on the seal to restore its appearance to that prior to the application of heat, whereby the orderly pattern of material is affected to result in the security seal exhibiting a perceivably different appearance when an attempt is made to tamper with the seal.

4,275,912

MULTISECTIONED CELLULAR ENERGY-ABSORBING UNIT AND MOUNTING THEREFOR

Dean M. Bayer, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 3, 1979, Ser. No. 99,852
Int. Cl.³ B60R 19/08
U.S. Cl. 293—120 2 Claims



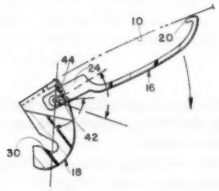
1. A vehicle bumper comprising a resilient energy absorbing unit, a support having a surface for backing and supporting said unit, said unit comprising a plurality of sections disposed adjacent to each other, each of said sections having a latticework of intersecting walls of plastic material providing plurality of elongated cells extending between inner and outer ends thereof, said support and a first of said sections having first and second separate attachment means cooperatively interfitting to secure said first of said sections to said support, said support and a second of said sections having third and fourth separate attachment means for securing said second of said sections to said support, live hinge means operatively interconnecting said first and second sections of said unit to permit said sections to be laterally moved with respect to one another to permit the alignment of said third and fourth attachment means for cooperatively interfitting with one another to thereby facilitate the attachment of said second section to said support and the securing of said energy absorbing unit to said support.

4,275,913

VEHICLE STORAGE RECEPTACLE

Konrad H. Marcus, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Apr. 19, 1979, Ser. No. 31,550
Int. Cl.³ B60R 7/08
U.S. Cl. 296—37.1 10 Claims



1. A storage receptacle for a vehicle including a pair of sun visors comprising:

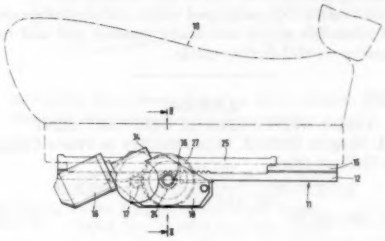
a mounting member adapted to be attached to the vehicle interior above the windshield and centrally between the vehicle's sun visors, a concave receptacle for containing articles pivotally coupled to said mounting member for pivotal movement about an axis between a closed position with the concave side facing the headliner of the vehicle interior whereupon the headliner serves as a closure wall for the receptacle and an open position pivoted downwardly from the headliner for providing access to the contents of said receptacle.

4,275,914

SAFETY SUPPORT FOR ADJUSTABLE VEHICLE SEATS

Rainer Holweg, Wermelskirchen, and Bernd Klüting, Radevormwald, both of Fed. Rep. of Germany, assignors to Keiper Automobiltechnik GmbH & Co. KG, Remscheid, Fed. Rep. of Germany

Filed Mar. 2, 1979, Ser. No. 17,160
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1978, 2808884
Int. Cl.³ B60N 1/08
U.S. Cl. 296—65 R 5 Claims



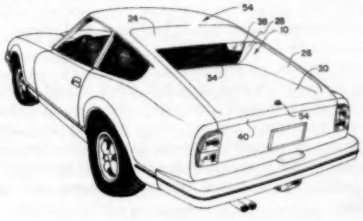
1. In a longitudinally adjustable seat, particularly a motor vehicle seat having a guide rail assembly including a stationary rail secured to the floor of the vehicle, a travel rail secured to the seat and being movably coupled to the stationary rail, a position adjuster fixedly mounted relative to said stationary rail and including a motor assembly having a driving pinion, a rotary shaft and a drive gear supported for joint rotation on the shaft, a combination comprising an intermediate drive gear supported for free rotation on said shaft and being in mesh with said pinion; an arresting ring arranged around said shaft and being fixedly mounted relative to said stationary rail; a coupling disk supported for joint rotation and for axial movement on said shaft; and means for axially biasing the coupling disk into a driving position in which it is coupled to said intermediate gear and, alternatively, into an arresting position in which it is coupled to said arresting ring.

4,275,915

VEHICLE CLOSURE

Michael Koritnik, 3350 Dunn, Cheyenne, Wyo. 82001

Filed Dec. 11, 1978, Ser. No. 968,621
Int. Cl.³ B62D 25/10
U.S. Cl. 296—76 11 Claims



1. A closure kit to be retrofitted to a motor vehicle for releasably isolating the passenger compartment and the storage compartment of said motor vehicle from the elements, said motor vehicle having an engine compartment, a passenger compartment and a storage compartment, the closure kit comprising:

a frame member having an aperture therethrough;

a body member adapted to be fixedly secured to said frame member, said body member integrally formed by a roof

portion, a window portion depending from said roof portion at an acute angle greater than 60° and having a window therein, a rear deck portion extending substantially perpendicularly from said window portion

a predetermined distance and having an aperture therethrough which is aligned with the aperture through said frame member, and side portions extending from said roof portion a predetermined distance, said side portions being arced along substantially the entire length thereof from the edge thereof to the rear deck portion and terminating into said rear deck portion, each of said side portions defining a peripheral edge of said closure; and

a latch adapted to be positioned within said aligned apertures to releasably secure said frame member and said body member to said motor vehicle.

4,275,916

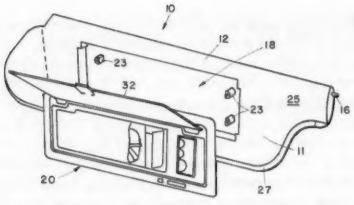
VISOR WITH STORAGE COMPARTMENT

Brian I. Skogler, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Apr. 19, 1979, Ser. No. 31,548

Int. Cl.³ B60J *3/00*

U.S. Cl. 296—97 H **9 Claims**



1. A visor assembly including a covered storage compartment comprising:

a visor body having a recess formed therein, said recess extending across a substantial portion of the frontal area of said visor and extending to a substantial depth within said visor;

mounting means disposed within said recess; and

a storage subassembly received in said recess and secured therein with said mounting means comprising:

a frame extending into said recess said frame being shaped to fit around the peripheral edge of said recess and said frame including sidewalls extending into said recess;

a storage means disposed on said frame for mounting within said recess said storage means extending across a substantial portion of the frontal area of said visor and extending to a substantial depth within said visor, said storage means substantially filling said recess;

a cover disposed on said frame; and

means for pivotally mounting said cover to said frame, said cover being pivotally mounted about an axis disposed above said recess on said visor whereby said cover is reciprocally pivotable upward to provide access to said storage means mounted within said recess and is pivotable downward to a closed position covering said storage means.

4,275,917

AUXILIARY VISOR

Konrad H. Marcus, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

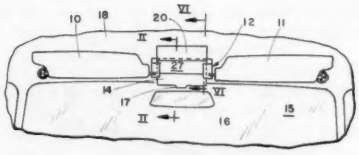
Filed Apr. 19, 1979, Ser. No. 31,549

Int. Cl.³ E60B *9/24*

U.S. Cl. 296—97 R **6 Claims**

1. An auxiliary visor for a vehicle having a pair of sun visors supported at opposite sides and above the vehicle windshield and a rearview mirror mounted between the sun visors, said visor comprising:

a mounting member adapted to be mounted to said vehicle above the windshield and centrally between the vehicle's visors wherein said mounting member includes a pair of opposed support means for releasably receiving and supporting the end posts of the pair of vehicle sun visors; and



a unitary shield supported by said member for movement with respect to said mounting member from a stored position above the windshield to an operating position extended from said mounting member in which said unitary shield covers the area of the windshield near the top thereof and between the visors, said shield being shaped to extend substantially to the edge of the existing visors to substantially fill in the gap between the visors.

4,275,918

RESILIENT SUSPENSION FOR THE CAB OF AN AGRICULTURAL TRACTOR

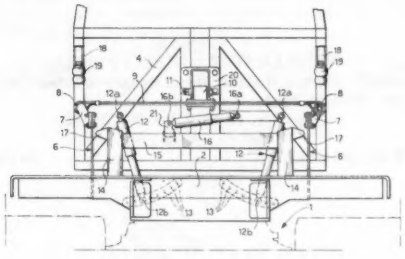
Bartolo Franco, Casalgrasso, Italy, assignor to Centro Ricerche Fiat S.p.A., Orbassano, Italy

Filed Jul. 5, 1979, Ser. No. 54,764

Claims priority, application Italy, Aug. 11, 1978, 68895 A/78

Int. Cl.³ B62D *33/06*

U.S. Cl. 296—190 **1 Claim**



1. In a vehicle such as an agricultural tractor having a body and a cab a resilient suspension which supports said cab from said body and which includes:

(a) respective front and rear transverse suspension structures, each comprising:

two struts formed by respective leaf springs upstanding from said vehicle body and disposed substantially in longitudinal planes when relaxed, and

a cross-member interconnecting said struts and formed by a leaf spring lying, when relaxed, in a plane which is perpendicular to said planes of said struts and parallel to the longitudinal axis of said vehicle, and

(b) shock absorber means to damp rolling and pitching oscillations of said cab relative to said vehicle body due to flexural resilience of said leaf springs of said suspension structures, wherein said shock absorber means include two pairs of first telescopic hydraulic shock absorbers, each pair being adjacent a respective said suspension structure, said shock absorbers of each pair being so in-

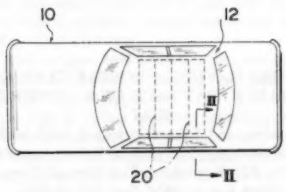
clined that their longitudinal axes converge downwardly towards said longitudinal plane of symmetry of the vehicle, each shock absorber being articulated at its upper end to said cab frame and at its lower end to said vehicle body and wherein said first shock absorbers are provided with respective means adjacent their said lower ends to enable said inclination of their respective longitudinal axes to be varied relative to each other.

4,275,919

SUSPENSION-TYPE HEAD LINING ARRANGEMENT FOR AUTOMOTIVE VEHICLE AND CLIP ELEMENT FOR USE THEREIN

Shoji Okamoto, and Norio Kazama, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 31, 1980, Ser. No. 117,192
Claims priority, application Japan, Feb. 6, 1979, 54-13396
Int. Cl.³ B62D *25/06*
U.S. Cl. 296—214 **22 Claims**



1. A suspension-type head lining arrangement for the roof structure of an automotive vehicle having a vehicle body including a pair of side frames each having lower edge portions which are secured together and which extend along each side end of the roof structure, comprising:

a clip element including

a laterally elongated base portion;

at least one strip portion bent from the base portion along one elongate end of the base portion;

a limb bent from the base portion along said elongate end of the base portion and having a cusped leading end portion which is turned back outwardly; and

a flank bent from said base portion along the opposite elongate end of the base portion and having at least one lug portion which is outwardly bent from an adjacent portion of the flank.

4,275,920

SLIDING ROOF PANEL

Lothar Pohl, Sterling Heights, Mich., assignor to Wisco Corporation, Ferndale, Mich.

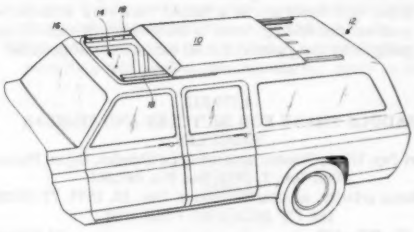
Filed Apr. 16, 1979, Ser. No. 30,558
Int. Cl.³ B60J *7/04*
U.S. Cl. 296—222 **8 Claims**

1. A sliding roof panel for selectively covering or uncovering an opening in a vehicle roof comprising:

a pair of spaced apart tracks attached to the roof projecting above the roof along sides of the opening;

the panel including downward extending co-operating front, rear and side walls extending to the roof and enclosing the tracks and vehicle opening when in a closed position;

the panel movable from a first position with the downward extending walls abutting the roof closing and sealing the opening, to a second position spaced above the tracks for



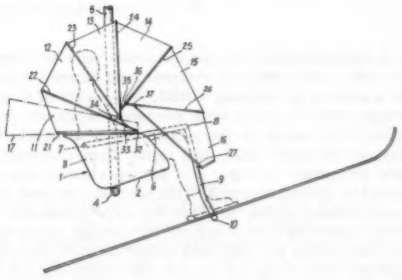
movement therealong, and to a third position displaced along the tracks uncovering the opening.

4,275,921

FOLDING HOOD FOR CHAIR-LIFTS

Paul Genin, 90 rue d'Assas, 75006 Paris, France

Filed Apr. 5, 1979, Ser. No. 27,333
Claims priority, application France, Apr. 10, 1978, 78 10512
Int. Cl.³ A49B *19/00*
U.S. Cl. 297—184 **3 Claims**



1. A chair for chair-lifts adapted to transport passengers shod with ski-boots and skis, comprising:

a carrier body,

a seat for passengers, rigid with said body and presenting an open front portion,

a guard rail pivoted to said body and adapted to pivot between a backward rest position and a forward safety position in which said guard rail comes in front of the opened portion of the seat,

a ski rest rigid with said guard rail,

a plurality of bows comprising a first bow fixed to the seat, intermediary bows each pivoted at its respective ends only to the preceding bow at a point offset in relation to the respective ends of said preceding bow, and a last bow pivoted at its ends at respective points of the preceding bow off-set from the ends of the preceding bow, said last bow, in an operative position of the bows, extending down to mid-legs of the passengers and presenting a free edge abutting against the ski rest when the guard rail is in its safety position, and

flexible wall elements disposed between said plurality of bows so as to constitute a folding hood, one of said flexible wall elements comprising a transparent element and being adapted, when the bows are in an extended operative position, to come in front of the passengers at the level of the field of vision thereof, so that when said bows are in their operative position, the folding hood constitutes with the chair body a nearly completely enclosed compartment

providing at the front and bottom portion thereof only an aperture for a free passage of the passenger's legs shod with ski-boots and skis, while maintaining by the free edge of the last bow the guard rail in its safety position, and when said bows are in a folded backward inoperative position the folding hood is maintained in said folded position by the guard rail in its backward rest position.

4,275,922

SADDLE SHANK FOR BICYCLES AND SIMILAR VEHICLES

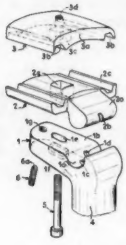
Henri Juy, Dijon, France, assignor to Le Simplex, Dijon, France

Filed Dec. 7, 1978, Ser. No. 967,304

Claims priority, application France, Dec. 19, 1977, 77 38929

Int. Cl.³ B62J *1/00*; F16B *7/08*

U.S. Cl. 297—195 **12 Claims**



1. A saddle shank for bicycles and similar vehicles, comprising: a tube; a mounting and abutment head fastened with the tube; a carriage for securing metallic body wires of a saddle and supporting the saddle while permitting adjustment of the position of the saddle in the general axis of a bicycle with respect to the saddle shank, said saddle shank comprising: a saddle supporting carriage, said carriage having one end mounted for pivotal abutment on the head, an other end of the carriage abutting against an adjustable screw means which is insertable into said head to support the carriage on the head, said carriage being provided with indents for stable bearing of the metallic body wires; a yoke; said yoke being provided with mating indents for co-action with indents of the carriage, being mounted above the carriage; and an assembly and interlocking means, such as a screw, extending with necessary clearance through the head and the carriage, between the pivotal abutment and the adjustable stop for threadable engagement within the yoke, the screw head being retained in abutment against the head.

4,275,923

VEHICLE CUSHION

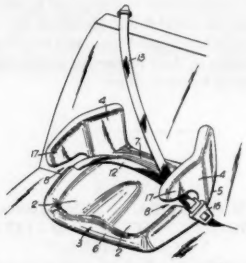
Thomas G. Molnar, Melbourne, Australia, assignor to Repco Limited, Melbourne, Australia

Filed Nov. 20, 1978, Ser. No. 961,922

Int. Cl.³ A47D *1/10*

U.S. Cl. 297—250 **7 Claims**

1. A cushion used in combination with a vehicle seat provided with a combination lap and sash safety belt, said cushion comprising a base having an upper seating surface, two wall portions on respective opposite sides of said base and projecting above said seating surface so as to form arm rests, and means in each said wall portion for holding the lap portion of said safety belt forward of and above its normal position on the vehicle seat and cooperating with said lap portion to hold the cushion on the vehicle seat, the said means of one said wall portion also being operative to hold a lower part of the sash portion of said safety belt down and forward relative to the back of the vehicle seat to accommodate therebetween an occupant of the cushion, said means comprising a slot in the respective said wall portion which has its open mouth facing towards the front of said cushion and which extends rearwardly from that open mouth to terminate at a closed end, said



lap portion being receivable in both said slots and said sash portion being receivable in one said slot only.

4,275,924

HINGE MOUNT HAVING A WOBBLE GEAR ADJUSTER FOR A TILTABLE SEAT BACK OF A MOTOR VEHICLE SEAT

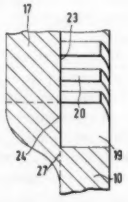
Gerhard Lehmann, and Erhard Hummel, both of Remscheid, Fed. Rep. of Germany, assignors to Keiper Automobiltechnik GmbH & Co. KG, Remscheid, Fed. Rep. of Germany

Filed Aug. 6, 1979, Ser. No. 64,393

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1978, 2834492

Int. Cl.³ A47C *1/025*; B21D *53/28*

U.S. Cl. 297—362 **4 Claims**

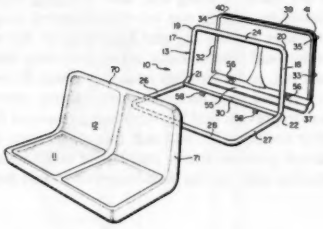


1. In an adjustable hinge mount for use in connection with a seat having a reclinable seat back, particularly a motor vehicle seat, including a first hinge member fixed to the seat and a second hinge member fixed to the seat back, a combination comprising a wobble gear assembly including an internal gear formed in the wall of one of said hinge members; a spur gear formed in the wall of the other hinge member, the diameter of said internal gear being larger than the diameter of said spur gear to mesh with the latter at one point only; a rotary axle interconnecting said hinge members and having a concentric portion supported for rotation at the center of said one gear and an eccentric portion supported for rotation at the center of said other gear to adjust the angular position of said hinge members when said axle is rotated, each of said gears being impressed in the wall of the associated hinge member to such a depth that the inner surface of the impressed portion is flush with a major surface of said hinge member; and wall bridges connecting each impressed portion to said major surface of its associated hinge member and formed respectively in the interstices between the teeth of said gear.

4,275,925
BACK SHROUD FOR SEAT

Arthur J. Harder, Jr., Franklin Park, Ill., assignor to Coach and Car Equipment Corporation, Elk Grove Village, Ill.

Filed Jul. 10, 1979, Ser. No. 56,327
Int. Cl.³ A47C 7/42
U.S. Cl. 297—444 **14 Claims**



1. In combination, (a) a seat frame back portion including a pair of vertically disposed side bars each having upper and lower end parts and a horizontally disposed upper bar extending between said upper end parts of said side bars and (b) a back shroud slidably mounted on said seat frame back portion, said back shroud comprising:

a pair of hook-shaped side marginal portions each having a bight integral with and extending from said back shroud and each having an upper end;

an integral top marginal portion extending between the upper ends of said side marginal portions;

said hook-shaped side marginal portions comprising means for engaging said side bars on the exterior thereof and mounting said marginal portions and said back shroud for vertical sliding movement on said side bars of the seat frame back portion;

said top marginal portion joining with the upper end of each of said side marginal portions to define two junctions;

said top marginal portion being a continuation of said side marginal portions to permit the upper ends of said side marginal portions to be slidably received, with said back shroud, upon the lower end of said side bars from below;

fastening means for engaging said back shroud to said seat frame back portion to hold said back shroud against downward sliding movement on said side bars;

and a horizontally disposed lower bar extending between, and indented frontwardly in relation to, the lower end parts of said side bars;

said fastening means comprising a first fastening element;

said back shroud comprising recessed means, in substantial alignment with said lower bar, for receiving said first fastening element and for at least partially obscuring it from view;

said fastening means comprising a second fastening element associated with said lower bar for engagement with said first fastening element.

4,275,926
DOWN HOLE PUMP WITH BOTTOM RECEPTOR

Everett L. Hodges, 49 Royal St. George, Newport Beach, Calif. 92660

Filed Jun. 28, 1979, Ser. No. 53,029
Int. Cl.³ E21B 10/44, 43/28
U.S. Cl. 299—17 **7 Claims**

1. An improved hydraulic mining apparatus for the economical recovery of mineral bearing materials from subterranian deposits comprising:

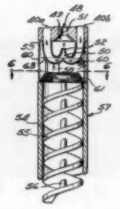
a drill string adapted to rotate within a bore hole extending from ground surface into said subterranian deposit;

a mining tool mounted on one end of said drill string to be disposed within said subterranian deposit;

a hydraulic cutting jet positioned on said mining tool for dislodging said mineral bearing material from said deposit and forming an aqueous mineral bearing slurry;

a hydraulic venturi pump located within the interior of said mining tool for transporting said aqueous mineral bearing slurry through said drill string to ground surface;

a first and second slurry inlet formed on said mining tool for permitting said aqueous mineral bearing slurry to enter



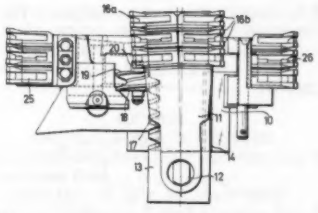
into said hydraulic venturi pump, said first inlet positioned to direct said aqueous mineral bearing slurry radially into said venturi pump and said second inlet positioned to direct said aqueous mineral bearing slurry axially into said venturi pump; and

means connected to said mining tool for continuously feeding said aqueous mineral bearing slurry upward through said second inlet.

4,275,927
MINERAL MINING PLOUGH WITH WORM ADJUSTABLE ROOF CUTTER

Gerhard Merten, Lunen; Oswald Breuer, Dortmund-Husen., and Bernd Steinkuhl, Lunen, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Aug. 10, 1979, Ser. No. 65,488
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1978, 2836133
Int. Cl.³ E21C 27/44
U.S. Cl. 299—34 **6 Claims**



1. A plough for winning material from a mineral face, the plough having a plough body, a carrier for roof-level cutters, and means for adjusting the vertical position of the carrier with respect to the plough body, wherein the adjusting means is constituted by a worm mounted on the plough body and a toothed rack associated with the carrier, the worm meshing with the toothed rack, and wherein the toothed rack is formed on a slider which is attached to the carrier, the slider being vertically slidable within a guide formed in the plough body.

4,275,928

PLANING APPARATUS WITH BRIDGING CUTTERS

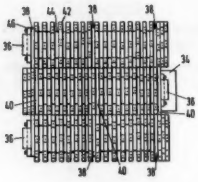
Philip Jackson, Chesterfield, England, assignor to Errut Products Limited, London, England

Filed Aug. 23, 1979, Ser. No. 68,760

Claims priority, application United Kingdom, Aug. 25, 1978, 34604/78; Feb. 7, 1979, 4259/79

Int. Cl.[3] E01C *23/09*

U.S. Cl. 299—39 22 Claims



1. Planing apparatus having a rotatable drum which comprises:

a central rotatable support;

a plurality of secondary supports spaced around the central support;

a plurality of support members extending radially from the central support and supporting the secondary supports in parallel relationship to the central support;

a plurality of cutting members mounted on each secondary support;

means axially spacing apart at least some of the cutting members on each secondary support;

the spaces between the cutting members on one of the secondary supports being bridged or almost bridged when viewed in a direction normal to the axis of the drum by the cutting members on one or more of the other secondary supports; and

each radially extending support member being bridged or almost bridged when viewed in a direction normal to the axis of the drum by at least one cutting member on one or more of the other secondary supports so that the depth to which the apparatus can plane is not limited to the distance between the radially outermost part of a cutting member and the radially outermost edge of any of the radially extending support members.

4,275,929

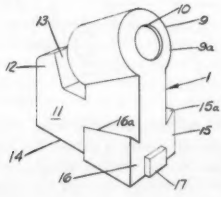
MEANS FOR REMOVABLY AFFIXING A CUTTER BIT MOUNTING LUG TO A BASE MEMBER ON THE DRIVEN ELEMENT OF A MINING MACHINE OR THE LIKE

Claude B. Krekeler, Cincinnati, Ohio, assignor to The Cincinnati Mine Machinery Company, Cincinnati, Ohio

Filed Aug. 25, 1978, Ser. No. 936,840

Int. Cl.[3] E21C *25/12*

U.S. Cl. 299—91 33 Claims



1. In a mining machine or the like of the type having at least one driven element adapted to advance a lug-base member assembly in a cutting direction, a base member mounted on said driven element, a bit carrying lug removably mounted in said base member, and a separate cutter bit removably mounted in said lug with a cutting end of said cutter bit exposed to act upon the material being cut, the improvement which comprises: said lug and said base member being configured so as to have a wedging engagement therebetween, which wedging engagement is enhanced when the said lug-base member assembly is moved in said cutting direction and said cutter bit acts upon the material being cut; said wedging engagement being achieved by at least one set of interrupted cooperating wedging surfaces on said lug and base member for retaining said lug within said base member while providing lateral support for said lug; and a separate retaining means for maintaining said lug in said base member, said retaining means being located so as to prevent said lug from being removed from said base member accidentally, and said retaining means being so configured and positioned as to enable said retaining means to be installed after said lug has been mounted in said base member.

4,275,930

WHEEL COVER COMPRISING TWO OR MORE COVER PLATES EACH HAVING SPOKE-LIKE PORTIONS INSEPARABLE FROM OTHER PORTIONS

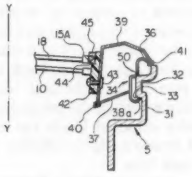
Kiyoshi Kamihama, Yokohama, Japan, assignor to Nissan Motor Company, Limited and Hashimoto Forming Kogyo Company Limited, both of Yokohama, Japan

Filed Jan. 22, 1979, Ser. No. 5,527

Claims priority, application Japan, Jan. 27, 1978, 53/7399; Jan. 27, 1978, 53/7868[U]

Int. Cl.[3] B60B *7/04*

U.S. Cl. 301—37 SS 13 Claims

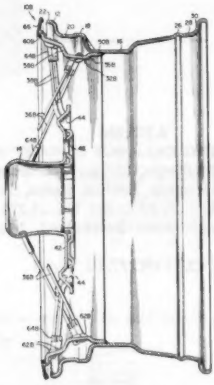


1. A wheel cover for a road wheel of a vehicle, comprising an assembly of at least two generally circular cover members assembled together in a concentrically piled arrangement and fixed to each other, each of said cover members being a one-piece member having a central portion, a generally annular peripheral portion and a multiplicity of elongate spoke-like portions each extending from the radially outer periphery of said central portion to said peripheral portion, said peripheral portion of one of said at least two cover members having a cylindrically shaped radially outer surface which provides a radially outermost peripheral surface of said assembly, said peripheral portion of the adjacent, remaining cover member being fixed to the radially inside of said peripheral portion of said one cover member, a retainer ring placed on an axially outer side of said peripheral portion of said remaining cover member and fixed to the radially inside of said peripheral portion of said one cover member, a generally annular frame formed of sheet metal and fixed closely to said radially outermost peripheral surface of said assembly and a plurality of resilient retaining means for securing the wheel cover to the rim of the road wheel fixed to the radially outside of said frame in a circumferentially spaced arrangement.

4,275,931
OFFSET WIRE WHEEL

Merlyn R. Reppert, Rancho Palos Verdes, Calif., assignor to W. R. Grace & Co., Columbia, Md.

Filed Jan. 30, 1979, Ser. No. 7,813
Int. Cl.[3] B60B *1/04*
U.S. Cl. 301—37 R 17 Claims

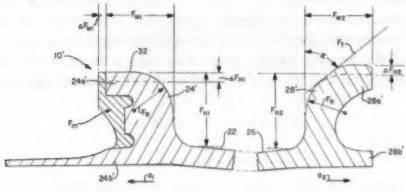


1. A weight bearing wire wheel center for use with and adapted to be affixed to the drop center portion of a tubless tire rim, said wheel center comprising a hub concentrically located within a felly and connected thereto by spokes, said felly comprising a closed circular member in planes perpendicular to the wheel center axis, the improvement comprising a plurality of portions of said felly arranged generally axially and axially seriatim, the axial innermost of said portions being adapted to be affixed to said rim, and a middle and outermost of said portions receiving the outer ends of said spokes.

4,275,932
NON-FRANGIBLE WHEEL

Roy W. Baird, Uniontown; Robert E. Berger, and Richard L. Kirk, both of North Canton, all of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Jun. 8, 1979, Ser. No. 46,891
Int. Cl.[3] B60B *21/00;* B64C *25/32*
U.S. Cl. 301—39 T 14 Claims



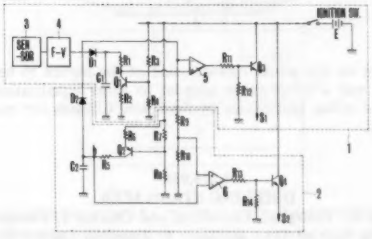
1. An improved aircraft wheel for mounting on a landing gear assembly associated with a landing gear strut, the wheel comprising inboard and outboard flanges forming bead seats for a mounted tire, the inboard and outboard directions of the wheel being with respect to the landing gear strut, the improvement comprising:

a differential flange height established between the inboard and outboard flanges such that the outboard flange height is greater than the inboard flange height by a predetermined amount, the differential flange height providing a substantially even distribution of the loading on the wheel flanges upon deflation of the mounted tire.

4,275,933
ANTISKID DEVICE

Katsuya Miyake, Ageo, Japan, assignor to Akebono Brake Industry Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 828,172, Aug. 26, 1977, abandoned.
This application Apr. 9, 1979, Ser. No. 28,443
Claims priority, application Japan, Sep. 6, 1976, 51-106450
Int. Cl.[3] B60T *8/02, 13/68*
U.S. Cl. 303—106 5 Claims



1. An anti-skid device for a vehicle comprising:

a wheel velocity signal producing circuit for detecting a wheel velocity and producing a signal corresponding to the wheel velocity;

a wheel skidding detection circuit for producing a braking pressure decrease signal when skidding of a wheel takes place and then cutting off the production of the braking pressure decrease signal upon restoration of the wheel velocity;

an increasing signal producing circuit for producing a reference acceleration signal which increases linearly from an initial voltage corresponding to the minimum wheel velocity during time after the restoration of wheel velocity, and which is isolated from the signal corresponding to the wheel velocity;

a comparator circuit for comparing the signal corresponding to wheel velocity with the reference acceleration signal and for producing a signal for modifying the brake pressure increase when the wheel velocity signal exceeds a predetermined relation to the reference acceleration signal and for cutting off the brake pressure modifying signal when the wheel velocity signal has less than the predetermined relationship to the reference acceleration signal; and

a pressure reducing device for decreasing the braking pressure in response to the braking pressure decrease signal, increasing the brake pressure of a first rate upon the restoration of wheel velocity, and increasing the brake pressure with a second set brake pressure increase rate higher than a first brake pressure increase rate in response to the output of the brake pressure modifying signal from the comparator circuit.

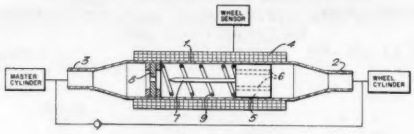
4,275,934
ANTI-LOCK BRAKE DEVICES

Douglas J. L. Macdonald, Lot 1157, Clear Water Bay Rd., New Territories, Hong Kong

Filed Dec. 19, 1978, Ser. No. 970,930
Claims priority, application United Kingdom, Dec. 21, 1977, 53216/77
Int. Cl.[3] B60T *13/68*
U.S. Cl. 303—119 7 Claims

1. An anti-lock brake device for use in a braking system of a vehicle, comprising a cylinder adapted to be installed in a pipeline connecting a master cylinder with one or more wheel cylinders, a solenoid-actuated operating member slidable in said cylinder and positionable to act as a valve member to prevent fluid flow through the device, means biasing said operating member to a position in which such fluid flow is

permitted, energization of the solenoid causing movement of the operating member against the biasing means so as to prevent said fluid flow and, as a result of volume displacement of at least a part of the operating member, to cause the fluid



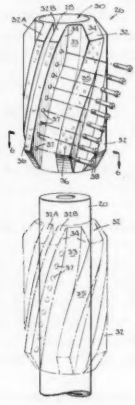
pressure on the wheel cylinder side of the device to be reduced, and a check valve adapted to allow equalization of pressure across said device by fluid flow towards the master cylinder.

4,275,935

DRILLING STABILIZER

Charles M. Thompson, Carrollton, and Charles T. Thompson, Dallas, both of Tex., assignors to American Coldset Corp., Addison, Tex.

Filed Jul. 17, 1979, Ser. No. 56,975
Int. Cl.³ F16C *29/02*
U.S. Cl. 308—4 A **22 Claims**



1. A stabilizer for an elongated tubular assembly for rotatably driving a well drill bit within a bore hole comprising:

(a) a hollow cylindrical body of hard material having a wall portion with an opening extending centrally throughout the length thereof substantially corresponding to the external transverse dimensions of the elongated tubular assembly and adapted to receive a length of the elongated tubular assembly therein, the wall portion being of a thickness so as to be deflectable;

(b) means formed of rigid material disposed upon the outer portion of the hollow cylindrical body and extending substantially along the length thereof for bearing upon the interior surface of a bore hole to stabilize the elongated tubular assembly within the bore hole when rotatably driving the well drill bit, said bearing means formed of rigid material having a slot extending throughout the length of the hollow cylindrical body within the length of the bearing means and intersecting the opening of the hollow cylindrical body; and

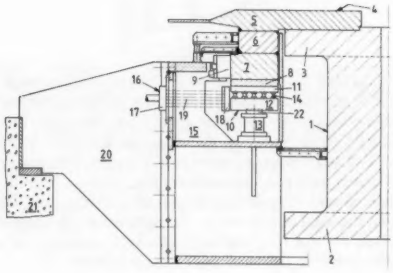
(c) means adapted to engage the bearing means adjacent one side of the slot and to extend across the slot to engage the bearing means adjacent the other side of the slot for varying the size of the opening to tighten the deflectable hollow cylindrical body into clamping engagement with the external surface of the elongated tubular assembly, the clamping engagement enabling the stabilizer to be fixedly positioned along the length of the elongated tubular assembly and to withstand torque and linear forces applied to the stabilizer in response to the engagement of the bearing means with the interior surface of a bore hole.

4,275,936

SEGMENT BEARING IN LARGE ROTARY MACHINES

Mihailo Starcevic, Mellingen, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Mar. 27, 1979, Ser. No. 24,270
Claims priority, application Switzerland, Mar. 29, 1978, 3329/78
Int. Cl.³ F16C *17/03, 17/06*
U.S. Cl. 308—73 **11 Claims**



1. A segment bearing of the type suitable for use in connection with a large rotatable shaft, the bearing including a segment comprising:

an inclinable support member having a support area;

a friction bearing member having bearing surface; and

means including a plurality of support elements between the support member and the friction bearing member, the support elements being distributed on the support area, each support element being constructed to have a compressive strength selected such that deflections of the bearing surface are essentially uniform whereby deflection of the bearing surface occurs in such a manner that the deflected condition is parallel to the unstressed condition.

4,275,937

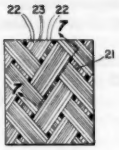
HOSE WITH BRAIDED REINFORCEMENT

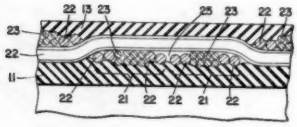
Harold Belofsky, Ravenna, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Sep. 19, 1979, Ser. No. 76,900
Int. Cl.³ F16L *11/08*
U.S. Cl. 308—127 **16 Claims**

1. A tubular braided hose reinforcement comprising means including a plurality of braided strands, each strand comprising a group of filaments of different diameters, said strands being spirally wound about a predetermined diameter, one of said

strands being wound in a right-hand direction and another being wound in a left-hand direction and alternately crossing





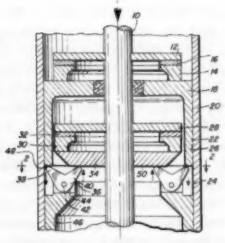
above and below each other, said means providing improved burst strength.

4,275,938

TANDEM THRUST BEARING

Leo L. Roberts, Claremore, Okla., assignor to Centrilift-Hughes, Inc., Tulsa, Okla.

Filed Nov. 21, 1979, Ser. No. 96,344
Int. Cl.³ F16C *17/04*
U.S. Cl. 308—162 **3 Claims**



1. A tandem thrust bearing arrangement for a rotating shaft comprising:

a first thrust runner fixed to the shaft;

a first thrust bearing for the first thrust runner,

an annular member surrounding the shaft supporting said first thrust bearing and axially movable with respect to said shaft;

a second thrust runner fixed to the shaft and spaced from the first thrust runner;

a second thrust bearing for the second thrust runner; and

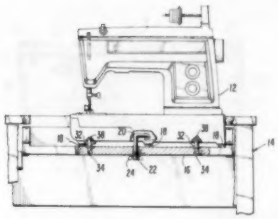
means supporting said second thrust bearing and axially movable by said annular member in response to axial movement of said annular member to transfer load to the second thrust bearing.

4,275,939

SEWING MACHINE POSITIONING PIN

Charles R. Odermann, Montville, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Aug. 21, 1978, Ser. No. 935,228
Int. Cl.³ A47B *21/00*
U.S. Cl. 312—208 **2 Claims**



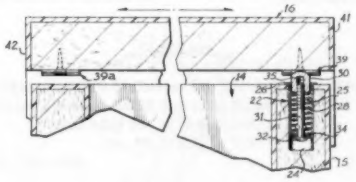
1. The combination of a sewing machine having stitch forming instrumentalities, a cabinet having a sewing machine support surface, and a positioning pin for locating any one of a variety of said sewing machines with respect to said support surface, said sewing machines having bases of varying heights wherein each base has at least one bore for receiving said positioning pin, said base having feet which rest on said support surface; said support surface also having at least one bore for receiving said positioning pin; said positioning pin comprising a first extremity and a second extremity; a flange intermediate said first and said second extremities; said first extremity being shorter than said second extremity so that said pin may be in either of two positions for accomodating any one of said variety of sewing machines having bases of varying heights.

4,275,940

UTILITY CABINET FOR DENTISTS

Leonard C. Draper, 3819 Kings Dr., Douglasville, Ga. 30135

Filed Jul. 12, 1979, Ser. No. 56,898
Int. Cl.³ A61C *19/02*; A47B *81/00*; A61B *19/02*
U.S. Cl. 312—209 **4 Claims**

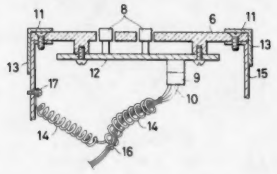


1. A utility cabinet, for dentists and the like, comprising four walls and a top, a pair of runners carried by two of said walls and carrying said top such that said top is movable with respect to said cabinet, said top having a closed position with respect to said cabinet and a functional position with respect to said cabinet, and latch means for latching said top in at least one of said positions, characterized in that said latch means includes a bolt mounted in one of said walls, said bolt having a surface with varying slope, spring means for urging said bolt towards the lower surface of said top, stop means for preventing said bolt from touching said lower surface of said top, and an escutcheon plate carried by said lower surface of said top, said escutcheon plate being spaced from said lower surface and located for engagement by said bolt.

4,275,941
SECURITY DEVICE FOR OPERATION PANEL

Tsutomu Ogasawara, and Kazuo Enomoto, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 16, 1979, Ser. No. 3,821
Claims priority, application Japan, Jan. 27, 1978, 53/9453[U]
Int. Cl.[3] H05K *5/02;* A47B *96/00*
U.S. Cl. 312—223 6 Claims

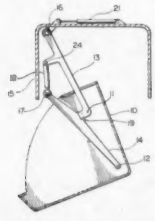


1. A device for securing an operation panel on a machine comprising: means engaging the operation panel and the machine frame to secure the panel to the frame, said engaging means arranged symmetrically relative to a rotating axis of the operation panel, and electrical wiring extending from the interior of the machine to the operation panel said wiring being provided with a length sufficient to allow the operation panel to be rotated with respect to, and secured to the machine frame in either of two positions disposed from one another through an angle of 180°, without disconnecting said wiring from said panel, and wherein said means for engagement between said operation panel and said machine frame comprises at least a pair of fastening means located about the periphery of said plate and said panel and extending between said plate and said panel, said fastening means being operable to releasably secure said panel to said frame.

4,275,942
STOWAGE BIN MECHANISM

Robert H. Steidl, Everett, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 26, 1978, Ser. No. 973,424
Int. Cl.[3] A47B *49/00;* B65D *43/24*
U.S. Cl. 312—266 21 Claims

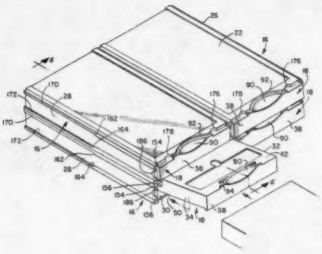


1. A stowage bin assembly comprising a supporting structure, a bin movable with respect to the supporting structure, and mechanism carrying said bin for said structure comprising a first pair of arms pivoted on said structure and on said bin, a second pair of arms vertically spaced from said first pair, pivoted on said structure and said bin, each of said second pair of arms being provided intermediate its length with an abutment, and each of said first pair of arms having a fork adjacent its movable end adapted to engage said abutment in one relative position of said arms.

4,275,943
CONTAINER FOR A CASSETTE

Anthony Gelardi, Kennebunkport; Paul Gelardi, Cape Porpoise; Stephen Swinburne, Scarborough; Michael Janiszewski, Biddeford; Robert MacLeod, Jr., Kennebunkport; James Philippe, and David Philippe, both of Sanford, all of Me., assignors to Shape Inc., Biddeford, Me.

Filed Mar. 31, 1980, Ser. No. 135,886
Int. Cl.[3] A47B *88/00;* B65D *85/672*
U.S. Cl. 312—319 37 Claims



1. A container for holding a cassette comprising:

(a) a rectangular casing having top, bottom and side walls, a rear wall and an open front;

(b) a frame-like bottomless slide reciprocally received in the casing for urging a casette along the inner surface of the casing bottom wall, said slide being slidable between a cassette-storing position within the casing and a cassette-exposing position partially-extended upwardly and outwardly from the casing and comprising side, rear and front walls, and a partial cutaway supporting and mounting top wall, wherein said top wall has a first section formed adjoining the rear and side slide walls and a second section formed adjoining the front and side slide walls, and wherein said side walls have upper edges tapered inwardly from the rear to a middle portion for allowing an upwardly tilting inclination of the slide against the casing top wall in the cassette-exposing position and lower edges tapered inwardly from the middle portion to the front for increased access to a stored cassette in the cassette-exposing position and for providing a pivoting point for the front portion of the slide in the cassette-storing position;

(c) spring means positioned between the rear walls of said casing and slide for biasing the slide toward the upwardly and outwardly extending cassette-exposing position,

(d) selectively releasable locking means comprising

(i) contact means for allowing finger pressure to be exerted downwardly on the slide to release the slide from a locked cassette-storing position and to selectively move the slide between the cassette exposing and storing positions, said contact means comprising a concave indentation formed in the outer surface of the front and top slide walls and a concave indentation formed in the forward edge of top casing wall for providing access to the slide concave indentation when the slide is in the locked position, and

(ii) locking means for retaining the slide in the cassette-storing position, said locking means comprising projections formed on the outer surface of the slide top wall second section adjacent and at opposite ends of the slide concave indentation, a recess formed in the inner surface of the casing top wall adjacent the casing concave indentation for receiving the slide locking projections when the slide is in the cassette-storing position and fingers formed at opposite forward ends of the recess adjacent the casing concave indentation for lockingly engaging the slide locking projections when the slide is in the cassette-storing position; and,

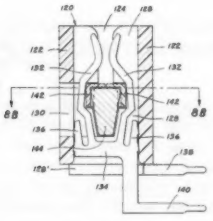
(e) stop and pivoting means for limiting movement of the slide to the partially-extended upwardly and outwardly cassette-exposing position, said stop and pivoting means comprising a pair of projections formed on the upper edge of the rear slide wall and a pair of grooves formed parallel to the side casing walls in the inner surface of the top casing wall and in which the slide stop projections slidably move, said slide stop projections engaging the forward ends of the grooves for limiting further outward movement of the slide from the casing and for establishing a pivoting point for the upwardly tilting movement of the slide against the top casing wall in the cassette-exposing position.

4,275,944

MINIATURE CONNECTOR RECEPTACLES EMPLOYING CONTACTS WITH BOWED TINES AND PARALLEL MOUNTING ARMS

Jerzy R. Sochor, 164 Rockview, Irvine, Calif. 92715

Filed Jul. 9, 1979, Ser. No. 55,731
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—74 R **23 Claims**



1. A contact of the type comprising a metal member having at least one elongated tine for making a primary contact, characterized in that said tine is cantilevered from a body portion of said contact, extends generally in a given direction from said body portion, has a convex mating surface facing in a direction perpendicular to said given direction, is springy and is able to flex in a plane aligned in said direction perpendicular to said given direction, and has a center portion thereof which is bowed away from a line aligned in said given direction,

said contact including a mounting arm also extending from said body portion in said given direction for at least the initial portion thereof, said mounting arm being separated from said tine by a bifurcating slot, said mounting arm also being springy and having a retaining edge facing in said direction perpendicular to said given direction, said retaining edge having at least one corner thereon for engaging the wall of an insulator housing,

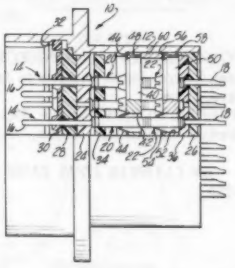
at least a portion of said mounting arm being positioned (a) under at least a portion of said tine, when viewed in a direction opposite to said given direction, and (b) in the same height area, measured in said given direction, as the portion of said tine adjacent said body portion of said contact and between said center portion of said tine and said body portion of said contact, whereby the dimensions of said contact in said given direction and in said direction perpendicular to said given direction will be minimized and the beam length of said tine will be optimized.

4,275,945

FILTER CONNECTOR WITH COMPOUND FILTER ELEMENTS

Leonard A. Krantz, and Edward P. Hogan, both of Sidney, N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Aug. 31, 1979, Ser. No. 71,445
Int. Cl.³ H01R *13/66*
U.S. Cl. 339—147 R **5 Claims**



1. In combination with a filter connector of the type having a metal shell and a plurality of filter contacts mounted in said shell, each of said filter contacts having a center conductor and a first and second filter element mounted on each of said center conductors; each of said filter elements including a dielectric sleeve disposed coaxially of said conductor and having at least one active capacitor electrode and a common ground electrode thereon, said ground electrode being disposed on the external surface of said sleeve; said first and second filter elements being connected in cascade with the active electrodes conductively connected with said central conductor; the improvement comprising:

a ferri-ceramic sleeve interposed coaxially of the dielectric sleeve and the conductor;

a first ground plate connecting the ground electrode of each of said first filter elements to said shell;

a second ground plate connecting the ground electrode of each of said second filter elements to said shell;

said active electrode is separated from the ground electrode; and

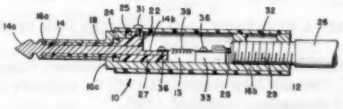
a coating of dielectric material covering the separation between the active electrode and the ground electrode whereby flash over between the ground and the active electrodes is minimized.

4,275,946

ELECTRICAL CONNECTING PLUG

Mitch Manina, 11090 McBroom St., Sunland, Calif. 91040, and William Lomenick, 16258 Stare St., Sepulveda, Calif. 91343

Filed May 16, 1979, Ser. No. 39,670
Int. Cl.³ H01R *17/18*
U.S. Cl. 339—183 **8 Claims**



1. A phone plug having special utility in the electrical musical instrument field, comprising:

a body;

a tubular electrode configured for insertion into an associated jack and extending outwardly from the body;

a second electrode having a rod shaped portion slidably disposed in the tubular electrode and a contact tip connected to the distal end of the rod shaped portion and

extending from the distal end of the tubular electrode, said rod shaped portion being electrically isolated from the tubular electrode along the length thereof;

bias means for normally biasing the contact tip against the distal end of the tubular electrode, thereby shorting the phone plug; and

activation means for disengaging the contact tip from the tubular electrode when the plug is inserted into an associated jack to thereby remove said short.

4,275,947

PLUG FOR ELECTRIC CONNECTIONS

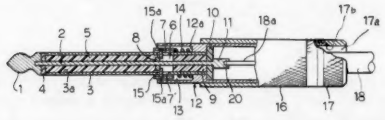
Taketoshi Takagi, Tokyo, Japan, assignor to Japan Music Supply Inc., Tokyo, Japan

Filed Jul. 20, 1979, Ser. No. 59,166

Claims priority, application Japan, Aug. 18, 1978, 53/112575[U]

Int. Cl.³ H01R *17/18, 33/54*

U.S. Cl. 339—183 **5 Claims**



1. In a connector plug for insertion into a jack, including a tip contact member having an elongated center lead rod extending therefrom, a cylindrical side contact member coaxially located around said center lead rod, insulation means for electrically isolating said tip contact from said side contact, and a plug body to which said tip and side contact members are mounted,

the improvement comprising:

a contactor electrically connected to said center lead rod;

a hollow cylindrical relief member circumferentially surrounding and electrically coupled to said cylindrical side contact member and movable relative to said side contact member between a first position in which said relief member directly electrically contacts said contactor and a position in which said relief member is out of electrical contact with said contactor, at least a portion of said relief member extending outside said plug body when in said first position; and

bias means for biasing said hollow cylindrical relief member toward said first position of said relief member to electrically connect together said center lead rod and said side contact member;

said hollow cylindrical relief member having a cylindrical forward end which is adapted to be forcedly pushed by an outer edge of a jack to cause said relief member to move to a position out of electrical contact with said contactor when said plug is inserted into said jack to thereby electrically disconnect said center lead rod from said side contact member.

4,275,948

ELECTRICAL CONTACT AND METHOD FOR MAKING SAME

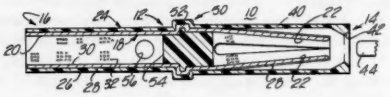
David O. Gallusser, Oneonta; Valentine J. Hemmer, Sidney, and Gary C. Toombs, New Berlin, all of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Aug. 31, 1979, Ser. No. 71,466

Int. Cl.³ H01R *13/12*

U.S. Cl. 339—218 R **12 Claims**

1. For use in an electrical connector of the type including at least one pair of pin and socket contacts, a socket contact comprising a tubular body having a foraminous metal wall defining inner and outer electrically conductive contact surfaces with the interstices thereof impregnated with plastic and the wall outer contact surface being coated by said plastic, said tubular body having a wire receiving end and a mating end having plural contact fingers, said mating end inciuding an electrically conductive contact surface adapted to engage a conductive surface of a mating contact, the conductive surface being free of said plastic except for islands of plastic in said



interstices and a plastic sleeve disposed coaxially of said contact fingers and being spaced radially therefrom, said sleeve terminating at its front and forwardly of said fingers and defining an opening coaxial therewith to provide a closed entry for guiding a pin contact into said contact fingers.

4,275,949

METHOD OF AND MEANS FOR SCANNING IMAGES

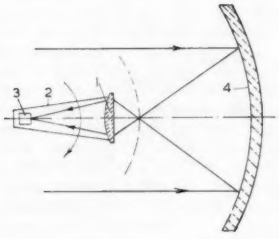
Neal K. Jones, 88 Gladstone Rd., North Brighton, South Australia, Australia

Continuation-in-part of Ser. No. 894,932, Apr. 10, 1978, abandoned. This application Mar. 27, 1980, Ser. No. 134,575

Claims priority, application Australia, Apr. 13, 1977, PC9731

Int. Cl.³ G02B *27/17*

U.S. Cl. 350—6.3 **14 Claims**



1. A method of scanning the image of a detector along a scan line in the field of view from which to detect objects in the field of view, which comprises:

(a) positioning a primary collecting spherical mirror of wide angular field to collect radiation from the field of view, said primary spherical mirror forming a spherical primary image surface containing uncorrected aberrations due to said primary mirror being spherical said aberrations being distributed uniformly over the said primary image surface,

(b) locating an auxiliary optical system between the primary optical system and the center of curvature of the primary image surface and arranged to scan the image field of the said primary spherical mirror by moving about an axis passing through the center of curvature of the said primary image surface,

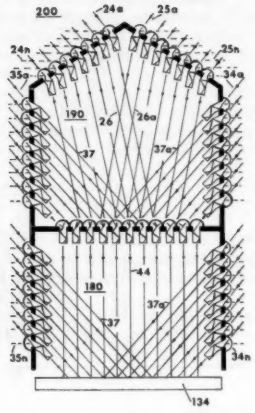
(c) correcting the aberrations of the primary spherical mirror by adjusting the spacings and shapes of the surfaces of the said auxiliary optical system to provide aberrations of opposite sign and equal magnitude to the aberrations produced by the primary spherical mirror,

(d) directing the corrected radiation from said auxiliary optical system on to a further detector optical system which focuses said corrected radiation on to a detector, whereby to produce an improved definition scanning system with wide field of view and at large relative aperture.

4,275,950
LIGHT-GUIDE LENS

Stanley A. Meyer, U.S. Post Office Tri-Village Station, Columbus, Ohio 43212

Filed Feb. 4, 1980, Ser. No. 104,081
Int. Cl.[3] G02B 5/16; F24J 3/02
U.S. Cl. 350—96.10 10 Claims



1. A solar energy light-guide collector-concentrator silo lens comprising an array of light-steering lenses inserted into a silo lens-plate in combination:

an enclosure,

a contoured capping light-guide lens positioned in the upper most region of said enclosure, said contoured capping light-guide lens comprising an array of light-steering lenses inserted into said contoured capping lens-plate, said light-steering lenses periodically displaced from each other in said array and wherein said light-steering lenses are directive to focus said solar energy to a plurality of spaced transference light-guide lenses in stacked relationship.

A focusing light-guide lens section positioned in the lower most region of said enclosure, said focusing light-guide lens comprising an array of light-steering lenses inserted into said focusing lens-plate, said light-steering lenses periodically displaced from each other in said array and wherein said light-steering lenses are directive to focus said collected solar energy to a central region.

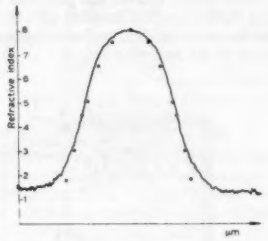
A contoured light-guide wall lens positioned within said enclosure intermediate of said contoured capping light-guide lens and said focusing light-guide lens and perimeter position around said transference light-guide lenses, said wall lens comprising an array of light-steering lenses inserted into said contoured wall lens-plate, said light-steering lenses periodically displaced in said array and wherein said light-steering lenses are operative to uniformly distribute said solar energy to said transference light-guide lenses.

Said enclosure further comprises a plurality of spaced transference light-guide lenses in stacked relationship within said wall lens, said transference light-guide lens comprising an array of light-steering lenses inserted into said flat-surface lens-plate, said light-steering lenses periodically displaced from each other in said array and wherein said light-steering lenses are directive to transfer said collected solar energy to said focusing lens.

4,275,951
OPTICAL FIBRES AND GLASSES

Keith J. Beales; William J. Duncon, both of Ipswich; Anthony G. Dunn, Woodbridge, and George R. Newns, Hintlesham, all of England, assignors to The Post Office, London, England

Continuation of Ser. No. 919,238, Jun. 26, 1978, abandoned.
This application Dec. 20, 1979, Ser. No. 105,652
Claims priority, application United Kingdom, Jun. 28, 1977, 26924/77
Int. Cl.[3] C03C 3/08, 13/00; G02B 5/14
U.S. Cl. 350—96.31 6 Claims



1. An optical fiber having

(a) a total insertion loss of less than 20 dB/km,

(b) a graded refractive index in which gradation of the refractive index is produced by thermal diffusion of alkaline earth metal ions,

(c) a cladding formed from a first glass composition consisting essentially of sodium oxide, boric oxide, silica and optionally alkaline earth metal oxide, said first glass composition being within the range defined by region A of FIG. 1 of the drawings or derived from a composition within that range by partial replacement of sodium oxide or sodium oxide and silica by alkaline earth metal oxide in a proportion not exceeding 20 mole percent, said first glass composition being non-devitrifying and non-phase-separating under optical fiber production conditions, and

(d) a core formed from a second glass composition consisting essentially of sodium oxide, boric oxide, silica and alkaline earth metal oxide, said second glass composition being derived from a composition within the range defined by region A of FIG. 1 of the drawings by partial replacement of sodium oxide or sodium oxide and silica by alkaline earth metal oxide in a proportion not exceeding 20 mole percent and sufficient to raise the refractive index to a value at least 1 percent higher than that of said first glass composition, said second glass composition being non-devitrifiying and non-phase-separating under optical fiber production conditions.

4,275,952
COMPACT ZOOM LENS BARREL WITH HIGH ZOOMING RATIO

Kyozo Uesugi, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 7, 1979, Ser. No. 91,942
Claims priority, application Japan, Nov. 17, 1978, 53-159295[U]
Int. Cl.[3] G02B 7/10
U.S. Cl. 350—429 12 Claims

1. A zoom lens barrel having incorporated therein an optical system comprising at least two lens groups, the first of the lens groups being usable for both focusing and zooming, the lens barrel comprising,

a stationary cylinder attachable or fixed to the main body of a camera,

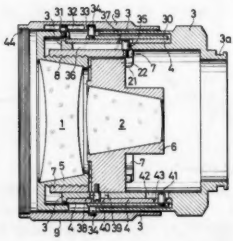
a single operating ring rotatably and axially movably supported on the outermost portion of the stationary cylin-

der, the operating ring being rotatable for focusing and axially movable for zooming,

a first lens moving frame axially movably supported by the stationary cylinder,

a first lens holding frame for holding the first lens group, the first lens holding frame being supported by the first lens moving frame with support means provided between the frames for moving the first lens group for focusing, the first lens holding frame being provided with means for engaging the holding frame with the operating ring to cause the holding frame to follow the movement of the operating ring only in the direction of rotation of the ring,

an intermediate member supported by the stationary cylinder movably axially thereof and provided with means for engaging the intermediate member with the operating ring to cause the intermediate member to follow only the axial movement of the operating ring,



a second lens holding frame supported by the stationary cylinder at least axially movably and holding a second lens group,

a cam member supported by the stationary cylinder and turnable about the axis of the cylinder,

means for converting an axial operating force on the operating ring to a torque of the cam member by way of the intermediate member and the stationary cylinder,

means for converting the rotation of the cam member to an axial movement of the first lens holding frame by way of the stationary cylinder and the first lens moving frame, and

means for converting the rotation of the cam member to an axial movement of the second lens holding frame by way of the stationary cylinder.

4,275,953

EXPOSURE PARAMETER INFORMATION GENERATING CIRCUIT IN A SINGLE LENS REFLEX CAMERA

Sakuji Watanabe, Warabi; Yoshiaki Ohtsubo, and Kenji Toyoda, both of Kawasaki, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Sep. 7, 1979, Ser. No. 73,449

Claims priority, application Japan, Sep. 14, 1978, 53/113017

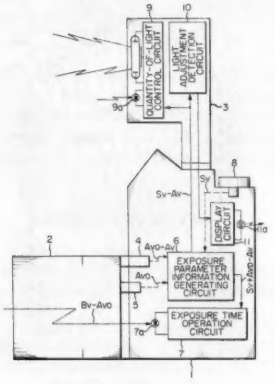
Int. Cl.³ G03B *7/08, 7/20*

U.S. Cl. 354—33 **7 Claims**

1. In a single lens reflex camera whose photographing lens is interchangeable, said photographing lens having a first signal member for mechanically putting out the information of an exposure parameter $A_{vo}-A_v$ (A_{vo} is an APEX symbol representing an aperture value when the diaphragm of said photographing lens forms a maximum aperture and A_v is an APEX symbol representing a present aperture value) and a second signal member for mechanically putting out the information of an exposure parameter A_{vo}, said camera being usable in combination with an electronic flash unit and having a third signal member for mechanically putting out the information of a preset exposure parameter S_v (this is an APEX symbol representing the ASA speed value), an exposure time operation circuit for metering the object light passed through the maximum aperture of the diaphragm of said photographing lens and operating a proper exposure time, and a circuit for generating exposure parameter information, said exposure parameter information generating circuit comprising:

(a) first converter means for converting the mechanical outputs of said first and third signal members into electrical output information $S_v+A_{vo}-A_v$;

(b) second converter means for converting the mechanical output of said second signal member into electrical output information A_{vo};



(c) an adder circuit for adding the electrical outputs of said first and second converter means and electrically putting out S_v-A_v information;

(d) a first output terminal for applying the output of said first converter means to said exposure time operation circuit; and

(e) a second output terminal for applying the output of said adder circuit to said electronic flash unit.

4,275,954

AUTOMATIC FOCUSING APPARATUS FOR CAMERA

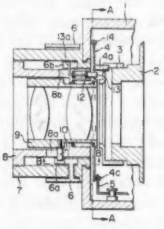
Toshio Dobashi, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 8, 1979, Ser. No. 64,717

Claims priority, application Japan, Aug. 17, 1978, 53-111965[U]

Int. Cl.³ G03B *3/00, 7/08*

U.S. Cl. 354—198 **9 Claims**



1. An automatic focusing apparatus for use in a camera for focusing a photographic lens by axial displacement thereof along the optical axis of the lens, the camera having winding means for winding film and for charging a shutter, and shutter release means for releasing the shutter to effect an exposure, comprising:

a manual focusing member movable within a predetermined range from a predetermined position;

means for coupling the manual focusing member to the lens

and for displacing the lens along the optical axis for focusing in accordance with the movement of the manual focusing member within said predetermined range;

automatic focusing means including an automatic focusing member coupled to the lens, the automatic focusing member having a charge position and being displaceable from the charge position in response to the operation of the shutter release means for displacing the lens along the optical axis for focusing in accordance with the displacement of the automatic focusing member;

blocking means for blocking movement of the automatic focusing member from the charge position except when the manual focusing member is in said predetermined position; and

means responsive to the operation of the winding means for moving the automatic focusing member from a displaced position to the charge position, said winding means being ineffective to vary the position of the manual focusing member.

4,275,955

SHUTTER RELEASE INTERRUPTING SYSTEM

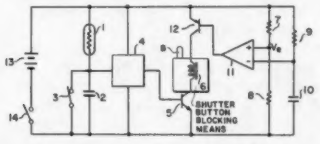
Kiyoshi Kitai; Yuzuru Takazawa, and Shinji Nagaoka, all of Shikawatashi, Japan, assignors to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1979, Ser. No. 12,508

Claims priority, application Japan, Feb. 20, 1978, 53-20521[U]

Int. Cl.³ G03B *17/38*

U.S. Cl. 354—268 **2 Claims**



1. A shutter release interrupting system comprising a shutter release button, a power source, a power source switch which is closed by an initial increment of movement of said shutter release button, and means for stopping the depression of said shutter release button when said shutter release button is pushed down more rapidly than a predetermined speed, said shutter release button stopping means comprising electromagnet means for stopping depression of said shutter release button, said stopping means being normally in condition to block further depression of said shutter release button and being operable to produce an unblocking condition, and a delay time control circuit for said electromagnet means, including an RC integrated circuit and a voltage comparator, said control circuit being actuated upon closing of said power switch and providing an output signal a predetermined delay time after closing of said power switch, said electromagnet means being connected with the output of said delay time control circuit, whereby activation of said electromagnet means to produce said unblocking condition is delayed by said delay time control circuit for a predetermined period of time after said power switch is closed.

4,275,956

DEVELOPING APPARATUS

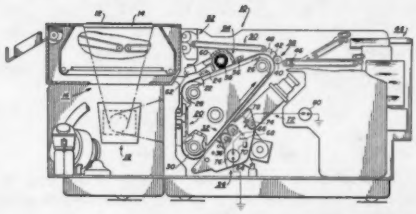
George E. Bell, Ontario; Clement B. Wilson; Daniel H. Thibado, both of Webster, and Kenneth S. Palumbo, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 802,749, Jun. 2, 1977, abandoned. This application Jan. 26, 1979, Ser. No. 6,703

Int. Cl.³ G03G *15/08*

U.S. Cl. 355—3 DD **4 Claims**

1. An improved developing apparatus for developing an electrostatic latent image on a photoreceptor, the developing apparatus including a developer housing defining a sump for containing developer comprising carrier beads and toner particles, a sensor for controlling the dispensing of additional toner into the sump, means for transporting toner from the sump to the photoreceptor to develop the latent image, and means for directing developer from the transporting means to the sensor before being returned to the sump, the directing means including a screen for separating contaminates from the developer before the developer arrives at the sensor and a guide plate for directing the developer from the transporting means to the screen, and the controlling means including means connected to ground for discharging the guide plate only after the guide plate has been charged to a predetermined value.



4,275,957

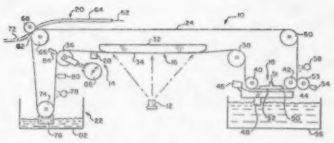
OFFSET PLATE IMAGE TRANSFER ATTACHMENT FOR GRAPHIC ART CAMERAS

Manfred R. Kuehnle, Lexington, and George J. Perry, Sudbury, both of Mass., assignors to Coulter Systems Corporation, Bedford, Mass.

Continuation-in-part of Ser. No. 802,573, Jun. 1, 1977, abandoned. This application Nov. 28, 1978, Ser. No. 964,204

Int. Cl.³ G03G *15/26*

U.S. Cl. 355—10 **77 Claims**



1. An attachment for a graphic arts camera for use in making a lithographic printing plate electrophotographically comprising:

rotatable endless web means including at least an electrophotographic surface portion, said web and electrophotographic surface portion including a front or exposure side and a back side;

drive means for rotating said web sequentially through a set of stations;

said set of stations including;

a charging station located adjacent said exposure side including corona means for charging said electrophotographic surface portion while it is in said charging station;

an exposure station following said charging station including planar platen means having a surface uniformly exactly in the image plane of the camera for accommodating the exposure side of the electrophotographic surface thereon to position and to hold said portion exactly in the image plane of the camera for exposure, sensing means for locating and stopping said electrophotographic surface portion against said platen means surface exactly in said image plane, and positive pressure fluid means at said exposure station operable to release said electrophotographic surface portion from the image plane upon completion of exposure whereby to facilitate passage of the web past said platen means;

a toning station immediately following said exposure station including means for applying a substantially constant amount of toner in a smooth and nonturbulent flow across the width of only said exposure side of the electrophotographic surface portion as it is moved through said toning station; and

a transfer station following said toning station including means for transferring an image from said exposure side of the electrophotographic surface portion onto a blank lithographic printing plate, including means for moving said transfer medium and said exposure side of the electrophotographic surface portion into close proximity during said transfer.

4,275,958

COPYING APPARATUS

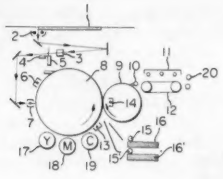
Tetsuji Tachika, Tokyo; Hisashi Sakamaki, Yokohama, and Hiroyuki Hattori, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

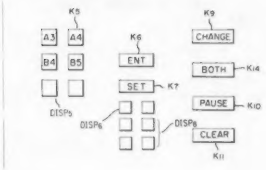
Filed May 17, 1977, Ser. No. 797,846

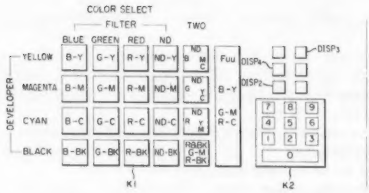
Claims priority, application Japan, May 21, 1976, 51-56705

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 R **20 Claims**







1. A copying system having a copying apparatus comprising:

storage means for storing different copy mode data for each of a plurality of copying operations, wherein each copying operation comprises the formation of a plurality of complete copies; and

control means for causing said copying apparatus to carry out a first copying operation to obtain a first plurality of copies in accordance with first copy mode data stored in said storage means, and, after terminating the first copying operation, to carry out a second copying operation to obtain a second plurality of copies in accordance with second copy mode data stored in said storage means, wherein the second copy mode data is different from the first copy mode data and is stored in said storage means during the first copying operation.

4,275,959

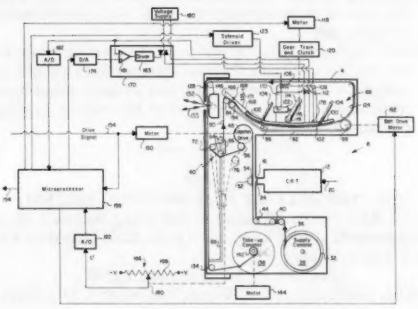
FILM PROCESSOR APPARATUS

Howard P. Jones, Salt Lake City, Utah, assignor to Edo Western Corporation, Salt Lake City, Utah

Filed May 10, 1979, Ser. No. 37,660

Int. Cl.³ G03B *27/72*

U.S. Cl. 355—20 **12 Claims**



1. A dry film processor for use in a system which supplies processor speed signals, said processor including

supply means for supplying dry film,

receiving means for receiving and holding film,

storage means for receiving film from said supply means and for supplying the film to said receiving means at a speed which may vary from the speed at which the film is received,

first drive means responsive to said speed signals for causing the film to move from said supply means to said storage means at a first variable speed determined by said speed signals,

means for exposing the film to light images to be stored on the film,

heater means for heating the film to enable development thereof, said heater means including a heater element movable toward and away from the film,

second drive means responsive to control signals for causing film to move from said storage means past the heater element at a second variable speed to said receiving means, which second variable speed may be different from said first variable speed, said second variable speed having a range of between zero and a maximum speed, and

control means for supplying control signals to said second drive means.

4,275,960

SYSTEM FOR ENHANCED LIGHT UNIFORMITY IN A DOCUMENT SCANNING SYSTEM

Millard A. Habegger, and Ross B. Hooker, III, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

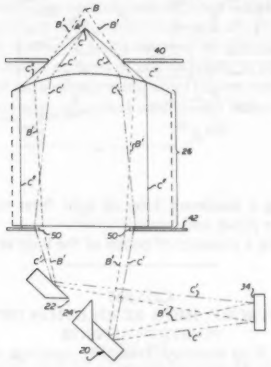
Filed Aug. 13, 1979, Ser. No. 66,052

Int. Cl.³ G03B *27/52, 27/80*

U.S. Cl. 355—68 **5 Claims**

1. In a system in which a light beam from a light source is scanned over the surface of a document or the like located at a nominal document position within the system, retro-scattered by the document, collected by a lens system and focused upon a detector and in which the intensity of the light impinging upon the detector is indicative of information contained upon the portion of the surface of the document being scanned, the improvement comprising:

means disposed between the nominal document position and the lens system for limiting the solid angle of collection of retro-scattered light from a first position beyond the nominal document position from the lens system to a first



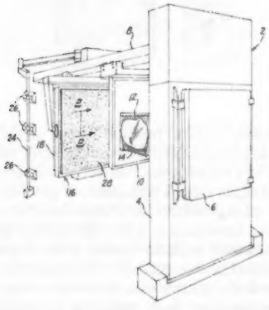
predetermined angular value and means disposed between the lens system and the detector for limiting the solid angle of collection of retro-scattered light from a second position between the nominal document position and the lens system to a second predetermined angular value.

4,275,961

HALFTONE PHOTOGRAPHIC METHOD AND APPARATUS

Emanuel J. Fontana, 10810 Tyrone Dr., Upper Marlboro, Md. 20870

Filed Aug. 14, 1979, Ser. No. 66,409
Int. Cl.³ G03B *27/72, 27/32*
U.S. Cl. 355—71 **10 Claims**



1. In the method for making a halftone from a continuous tone original copy utilizing a process camera means in which are mounted a suitable screen and a negative, said process camera means including a copyboard upon which the original copy is mounted, the method steps of:

making a main exposure of said negative by illuminating the original copy and opening the lens of said process camera for a first selected period of time;

placing a reflector board over said original copy, said reflector board having a gray scale value greater than the gray scale value of the highlight and at least the lower middletone areas of the original copy;

making a supplemental exposure of said negative, by illuminating the reflector board and opening the lens of said process camera for a second selected period of time; and

developing said exposed negative.

7. In apparatus for making a halftone from a continuous tone original copy, said apparatus including a process camera means for mounting a suitable screen and a negative, and a copyboard means adapted for mounting said original copy thereon:

a reflector card for use in making a supplemental flash exposure of said original copy;

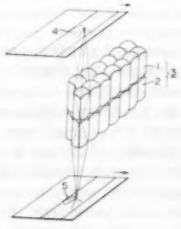
said reflector card being adapted for mounting on said copyboard means, and having a gray scale value which lies in a range of between about 45% to about 80% of the shadow density of the original copy.

4,275,962

PROJECTION DEVICE

Koyo Midorikawa, Tokyo; Atsuo Tsunoda, Fuchu; Hidetoshi Murase; Noritaka Mochizuki, both of Yokohama; Setsuo Minami, Kawasaki; Yoshiya Matsui, Yokohama; Masazumi Moriwaki, Tokyo, and Mikio Suzuta, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1979, Ser. No. 105,789
Claims priority, application Japan, Dec. 28, 1978, 53-165885; Dec. 28, 1978, 53-165886; Dec. 28, 1978, 53-165887; Dec. 28, 1978, 53-165888; Dec. 28, 1978, 53-165889; Dec. 28, 1978, 53-165891; Dec. 28, 1978, 53-165893; Dec. 28, 1978, 53-165894; Dec. 28, 1978, 53-166049; Dec. 28, 1978, 53-166054; Dec. 28, 1978, 53-166055
Int. Cl.³ G03B *27/00*
U.S. Cl. 355—1 **13 Claims**



1. A projection device having:

two bar lenses each having a great length in the direction of the optic axis thereof as compared with the effective diameter thereof and controlling the distribution of intensity of light in a predetermined part area on an image plane corresponding to a part area of an object, by a lens aperture eclipse, said distribution of intensity of light being such that the intensity of light is weaker in the marginal area than at least in the central area;

a light absorbing portion provided on the outer peripheral portion of said bar lenses for attenuating and eliminating unnecessary light rays which reach the other portion of said bar lenses than the effective diameter area thereof;

one lens holding member for controlling the position of a plurality of element lens systems in the direction of the optic axis arranged substantially equidistantly in a predetermined direction in a plane perpendicular to the optic axis, by groove portions in the direction of the optic axis, such that distributions of intensity of light are superposed upon one another at least in said marginal area, each of said element lens systems comprising said light absorbing portion and said bar lenses; and

the other lens holding member provided with substantially equidistant groove portions offset by a half pitch with respect to and opposed to said groove portions of said one lens holding member, said other lens holding member being for controlling the position of said element lens systems in the direction of the optc axis in said groove portions.

4,275,963
METHOD AND APPARATUS FOR SENSING ULTRASONIC ENERGY

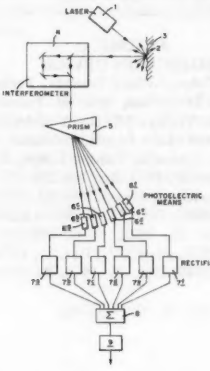
Erik Primbsch, Cologne, Fed. Rep. of Germany, assignor to Krautkramer-Branson, Inc., Stratford, Conn.

Filed Feb. 21, 1980, Ser. No. 123,377

Claims priority, application Fed. Rep. of Germany, May 8, 1979, 2918384

Int. Cl.³ G01B *11/16, 9/02*

U.S. Cl. 356—35.5 **5 Claims**



1. Method for sensing by optical means the surface deformation of a workpiece resulting from ultrasonic energy which is propagated in such workpiece comprising:

illuminating the workpiece surface where such deformation is to be sensed with a laser beam whose light spectrum contains a plurality of discrete wavelengths;

passing the laser beam light reflected at the workpiece surface through interferometer means;

separating the laser beam light from the interferometer means into separate light beams corresponding to said plurality of discrete wavelengths;

providing a plurality of electrical signals corresponding to said light wavelengths;

rectifying separately each of said electrical signals whereby to provide a plurality of direct current electrical signals, each signal responsive to the intensity of light of a respective wavelength, and

summing said direct current electrical signals.

4,275,964
APPARATUS AND METHOD FOR DETERMINING THE REFRACTIVE CHARACTERISTICS OF A TEST LENS

Arthur Vassiliadis, Mountain View, Calif., assignor to Rodenstock Instruments Corporation, Sunnyvale, Calif.

Filed May 18, 1979, Ser. No. 40,139

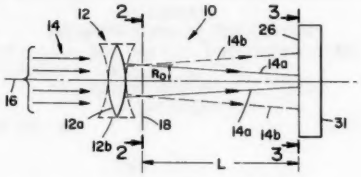
Int. Cl.³ G01B *9/00*

U.S. Cl. 356—125 **28 Claims**

24. A method for determining the refractive characteristics of a test lens, comprising:

(a) generating a nonrotatable collimated beam of light surrounding a central axis;

(b) propagating the beam of light through the test lens to refract the light beam;



(c) forming a stationary loop of light from the refracted beam at a plane, and

(d) detecting a plurality of points of the loop at the plane.

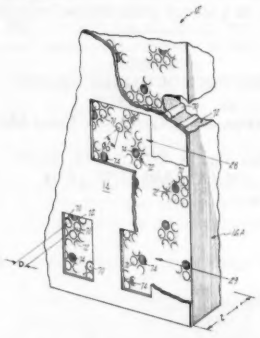
4,275,965
LONG STROKE, HIGH RESOLUTION OPTICAL POSITION SENSOR

Elias Snitzer, West Hartford; Donald E. Anschutz, Somers, and Edward V. Fox, Jr, East Granby, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 21, 1979, Ser. No. 68,374

Int. Cl.³ G01B *11/14*

U.S. Cl. 356—375 **4 Claims**



1. An improved optical position sensor of the type which includes a code plate adapted for movement, in unison with the displacement of a reciprocating device whose position is to be measured, through a light transmission path established between the matching surfaces of a light transmitter and a light receiver spaced therefrom at a first dimension, the code plate including a substrate with an optical mask disposed thereon, the mask encoded with a plurality of transparent and opaque regions arrayed along each of a plurality of bit channels, the transmitter and receiver each including an optical waveguide associated with each bit channel to provide, in combination with a light emitting source and a light detecting source connected thereto, an encoded optical signal for each bit channel in dependence on the position of a transparent region or an opaque region therebetween, the improvement comprising:

a code plate having a substrate comprising a fiber optic faceplate, said faceplate having two major surfaces relatively spaced at a dimension selected in dependence on the first dimension, each parallel to an associated one of the surfaces of the transmitter and receiver, said faceplate including a plurality of adjacent transmissive fiber optic cores disposed in parallel between said major surfaces, each of said cores being encased along the circumferential length thereof with an optical cladding material having a lower index of refraction than said cores to provide a plurality of parallel optical waveguides through said sub-

strate, each waveguide providing a light transmission path therethrough from one end thereof at said major surface adjacent the transmitter to the other end thereof at said major surface adjacent the receiver, said code plate further including an optical mask encoded with a plurality of transparent and opaque regions in each of a plurality of bit channels, said mask being adapted for disposal on one of said two major surfaces of said faceplate to provide registration of each of said transparent regions with a portion of said plurality of optical waveguides therein.

4,275,966

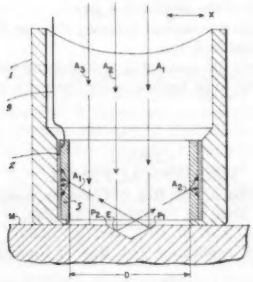
METHOD AND APPARATUS FOR THE MEASUREMENT OF HARDNESS TESTING INDENTATIONS

Claus Kleesattel, Apartado 4969, San Jose, Costa Rica

Filed Jan. 18, 1979, Ser. No. 4,325

Int. Cl.³ G01B *11/22*; G02B *27/17*; G01N *3/40*

U.S. Cl. 356—378 **5 Claims**



1. The method of measuring the magnitude of hardness testing indentations in solid surfaces utilizing a beam from a light source which at the point of incidence is small with respect to the size of the indentation being measured and which is directed at substantially normal incidence to the indented surface comprising the steps of:

(a) applying a loading force through a transparent indenter in the same direction as the incident light beam,

(b) scanning an indentation made in the solid surface under test through said indenter in at least one direction by moving said light beam across the working surface of the indenter at substantially normal incidence to the plane of said solid surface,

(c) encircling the light exit surface of the transparent indenter with a light-sensitive surface in accordance with the geometries of said indentation and indenter which does not interfere with the scanning of said indentation, said light sensitive surface receiving light specularly reflected from said indentation;

(d) measuring the intensity of the specularly reflected light from said indenter and indentation within a predetermined angular range covered by said light-sensitive surface, and

(e) determining the magnitude of said indentation utilizing the intensity variation of the specularly reflected light from said indenter and indentation occurring when the light beam arrives at or exits the indentation.

4,275,967

METHOD FOR THE CONTINUOUS PRODUCTION OF EXPLOSIVE MIXTURES

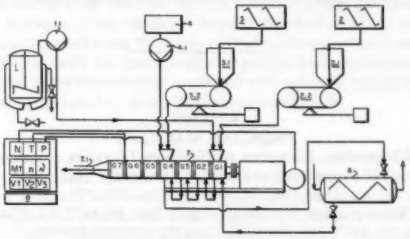
Emil-Richard Erbach, Voiswinkeler Str. 45a, 506 Bergisch Gladbach 2; Max Klünsch, Bruchhauser Str. 57, 509 Leverkusen; Gerhard Lindner, Schillerstr. 4a, 5064 Rosrath, and Paul Lingens, Kursiefener Str. 22, 5068 Odenthal, all of Fed. Rep. of Germany

Filed Jun. 6, 1979, Ser. No. 46,080

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1978, 2825567

Int. Cl.³ B01F *7/08*; C06B *21/00*

U.S. Cl. 366—149 **5 Claims**



1. In a method for the continuous manufacture of explosive mixtures by mixing their components in screw mixers with at least one charging aperture, the improvement comprising: bringing proportioned amounts of the components of the mixture into entry zones provided with screw elements and situated beneath the charging aperture and advancing the mixture components through kneading zones which are interupted by transport zones having screw elements, to the output end, the transport and kneading zones being selectively adjusted in sequence and configuration and being furthermore adjusted such that in these zones a shear gradient between 20/sec and 1500/sec is present and the maximum pressure in the stream of the mass is not more than 100 bars.

4,275,968

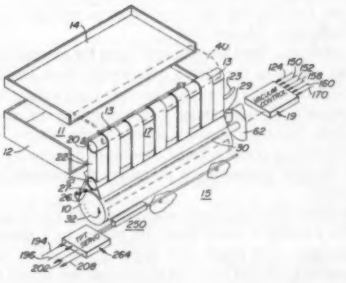
SYSTEM FOR CONTROLLING AND SEQUENCING A PRINTER

John W. Irwin, Loveland, Colo., assignor to IBM Corporation, Armonk, N.Y.

Filed Apr. 30, 1979, Ser. No. 34,841

Int. Cl.³ B41J *13/00*

U.S. Cl. 400—582 **32 Claims**



1. A system for printing having a plurality of operating parameters at least a predetermined one of which is critical in a cycle of printing a copy comprising

means for determining the actual value of said critical oper-

ating parameter during a nonprinting cycle for providing a profiled critical parameter,

means for storing said critical parameter value,

means for using said stored critical parameter value as the used value of said critical parameter during printing cycles subsequent to the profiling cycle,

said determining means for also determining the actual value of said critical operating parameter during said subsequent printing cycles, and

means for updating during each printing cycle the stored critical parameter value in said storing means as a function of the difference between (1) the value of the used critical parameter and (2) the value of said critical parameter determined during that respective printing cycle.

4,275,969
PRINTING MACHINE

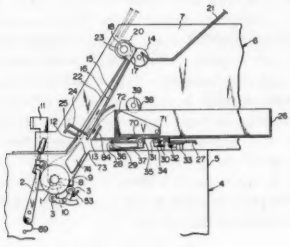
Koh Matsuhisa, Kanagawa, and Mamoru Takezawa, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Dec. 28, 1978, Ser. No. 974,099

Claims priority, application Japan, Dec. 28, 1977, 52-157476; Dec. 28, 1977, 52-175949[U]; Dec. 28, 1977, 52-175951[U]

Int. Cl.³ B41J *13/036, 13/10*

U.S. Cl. 400—625 **8 Claims**



6. A printing machine comprising:

a platen for moving a sheet supplied thereto from the rear and above and wound thereon;

printing means for printing characters and symbols on the sheet wound on the platen;

a paper ball for pressing the sheet against the platen in a position slightly displaced from a printing position in a direction in which the sheet is delivered after a printing operation is performed on the sheet;

means for ejecting the sheet after a printing operation is performed thereon; and

an automatic sheet feeding apparatus for automatically feeding sheets to the platen comprising sheet feeding means for feeding one sheet after another from a sheet supporting position disposed under said feeding means, and a lower guide plate for guiding sheets to the platen, said sheet supporting position being capable of detachably mounting a cassette containing a plurality of horizontally stacked sheets;

said sheet ejecting means comprising an upper guide plate for guiding a sheet from the platen to a sheet ejecting position, said lower and upper guide plates being supported such that they can be opened and closed and defining, when brought to an open position, a cassette mounting opening through which the cassette can be inserted in a rearward direction from the front of the printing machine to be mounted substantially horizontally on the sheet supporting position.

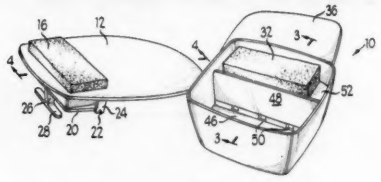
4,275,970
PLANT CARE KIT

Howard J. Morrison, Deerfield, and Douglas P. Montague, Chicago, both of Ill., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Aug. 15, 1979, Ser. No. 66,519

Int. Cl.³ A47L *13/42;* **A01G** *1/00;* **A47L** *13/12, 13/51*

U.S. Cl. 401—6 **14 Claims**



1. A plant care kit, comprising:

a generally planar support means for gently supporting a leaf of a plant or the like;

a first cleaning element mounted on the top surface of said support means for engaging the underside of the leaf;

a handle mounted on the bottom surface of said support means for limited oscillation about an axis generally parallel to the bottom surface;

said handle including means for captured interdigitated engagement of the fingers of a user;

a manually operable second cleaning element for engaging the top of said leaf; and

reservoir means for containing a predetermined amount of cleaning fluid to be applied to the leaves by said cleaning elements.

4,275,971
MECHANICAL PENCIL

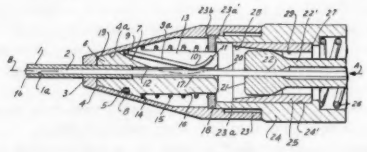
Otto Katz, Schwabach, Fed. Rep. of Germany, assignor to A.W. Faber-Castell, Stein bei Nuernberg, Fed. Rep. of Germany

Filed Apr. 10, 1979, Ser. No. 28,807

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1978, 2815695

Int. Cl.³ B43K *21/00*

U.S. Cl. 401—80 **10 Claims**



1. A mechanical pencil, comprising an elongated tubular casing formed with a lead-guiding passage having a leading end open outwardly away from said casing; means for advancing a lead through said lead-guiding passage, said means being movable between a first position in which the lead is clamped and a second position in which the lead is released, the lead tending to undesirably slide along said lead-guiding passage when the advancing means are in said second position and the lead is released; means for normally pressing the lead, when the latter is in said passage, against an inner surface of the passage for thereby preventing the undesirable sliding of the lead along the passage when said advancing means release the lead, including an elongated element engageable with the lead, when the latter is in said passage, and biasing means for pressing said element in direction towards and into said passage, said biasing means including a spring ring connected to said element and so located in said casing as to normally press the element towards

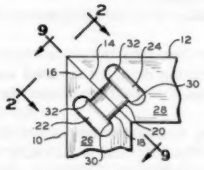
and into said passage; means for mounting said lead-pressing means in said housing, said mounting means including a recess for so receiving said lead-pressing means therein as to permit the latter to press the lead against the inner surface of the passage when the lead is in said passage, and including a member mounted in said casing for movement relative thereto, said lead pressing means being so mounted on said member as to move together therewith, said recess being provided on said member; and wherein said member is further provided with a circumferential groove for rigidly receiving therein said spring ring, and a conical portion converging towards said leading end of said passage, said conical portion having a largest diameter exceeding and a smallest diameter smaller than the inner diameter of said spring ring.

4,275,972

MITRE JOINT AND FASTENER THEREFOR

Michael W. Bowen, and Andrew C. Bowen, both of 1847 Parr Hwy., Adrian, Mich. 49221

Filed Feb. 8, 1979, Ser. No. 10,493
Int. Cl.³ F16B *7/04*; A47G *1/10*; F16B *12/10*
U.S. Cl. 403—401 **12 Claims**



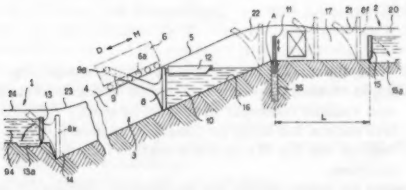
1. A mitre joint for picture frames and the like comprising: two members to be joined having juxtaposed surfaces to be held together; a pocket hollowed out in each member inwardly from their juxtaposed surfaces; a channel in each member communicating its pocket with said juxtaposed surfaces, said channel having a width that is less than that of said pockets to leave pocket gripping surfaces on opposite sides of said channels; a foreshortenable fastener extending across said channels with opposite end flanges in said pockets, said flanges being constructed and arranged to abut said pocket gripping surfaces, said foreshortenable fastener having top and bottom sides extending between said opposite end flanges, and means for bowing at least one of said top and bottom sides toward the other.

4,275,973

INSTALLATION FOR ACCELERATING NAVIGATION OF A WATER RAMP AND METHOD RELATING THERETO

Jean Aubert, 8 rue la Boétie, 75008 Paris, France

Filed Aug. 23, 1979, Ser. No. 69,183
Claims priority, application France, Sep. 7, 1978, 78 25727
Int. Cl.³ E02C *3/00*
U.S. Cl. 405—86 **16 Claims**



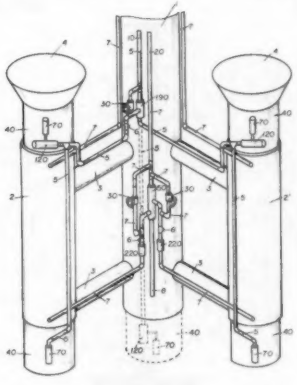
1. Installation enabling the passage of boats through a change of level on an inland waterway by means of a water ramp connecting, through an inclined channel, two reaches respectively situated upstream and downstream and comprising boat storage basins for accommodating boats awaiting their turn before proceeding into the inclined channel, the upstream reach being provided with a tilting gate for retaining the water, whilst a pusher, provided with a transverse mask retaining a water-wedge on which a boat to be moved floats, is movable along the channel to ensure the transfer of said boat from the downstream reach to the upstream reach and vice versa, the retaining gate of the upstream reach being installed at a certain distance beyond the upstream end of the inclined channel and a second retractable gate being arranged substantially at the end of the inclined channel, these two gates defining between them an intermediate horizontal reach, separating the upstream end of the inclined channel and the upstream basin, said installation comprising runways for the pusher driving the mask, said runways being extended beyond the lock-walls of the inclined channel along the banks of the intermediate reach, and means to enable the passage of said pusher from the inclined channel to the intermediate reach and vice versa, as well as the travel of said pusher along the intermediate reach.

4,275,974

INFLATION AND GROUT SYSTEM

Lloyd C. Knox, and Bob L. Sullaway, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Feb. 15, 1979, Ser. No. 12,674
Int. Cl.³ E02B *17/00*
U.S. Cl. 405—225 **71 Claims**



1. An inflation control valve system and a grouting control valve system for controlling the pressure and flow of inflation fluid during the inflation of upper inflatable packers and lower inflatable packers installed on a plurality of pile sleeves of an offshore platform and for controlling the pressure and flow of grouting material during the grouting of the annuli formed between a jacket leg and a pile driven therethrough and said plurality of pile sleeves and piles driven therethrough of said offshore platform, said inflation control valve system utilizing a single inflation line from the surface of said offshore platform to supply said inflation fluid to said upper inflatable packers and said lower inflatable packers installed on said plurality of pile sleeves and said grouting control valve system utilizing a single line from the surface of said offshore platform to supply said grouting material to said annuli,

wherein said inflation control valve system comprises:

upper packer inflation control valve means controlling the pressure at which said inflation fluid initially flows into said upper inflatable packers;

upper packer inflation check valve means connected to said upper packer inflation control valve means pre-

venting said flow of inflation fluid from said upper inflatable packers after the inflation thereof;

lower packer inflation check valve means preventing said flow of inflation fluid from said lower inflatable packers after the inflation thereof; and

inflation valve means connected to said single inflation line to selectively control said flow of inflation fluid to said upper inflatable packer and said lower inflatable packer installed on a first pile sleeve of said plurality of pile sleeves and another upper inflatable packer and lower inflatable packer installed on a second pile sleeve of said plurality of pile sleeves; and

wherein said grouting control valve system comprises:

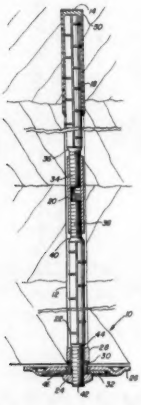
grouting valve means connected to said single grouting line to selectively control said flow of grouting material to said annuli.

4,275,975

MINE ROOF ANCHOR SYSTEM

Bennie E. Morgan, 411 E. Main St., Morganfield, Ky. 42437

Filed Sep. 21, 1979, Ser. No. 77,534
Int. Cl.³ E21D *21/00*
U.S. Cl. 405—261 **5 Claims**



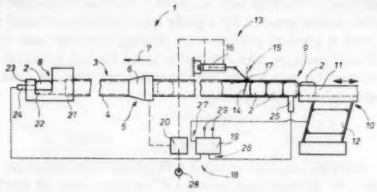
1. A mine roof anchor system including an elongated upstanding shaft assembly having first upper and second lower end portions, said first upper end portion including means for rupturing and mixing, upon rotation of said first end portion thereagainst, a resin capsule seated in a bore into which said first end portion is inserted, the second lower end portion of said shaft assembly including a diametrically reduced externally threaded terminal end and a conical shoulder merging said threaded terminal end with the large diameter section of said second end portion, radially expandable sleeve means slidingly disposed on said diametrically reduced terminal end, a roof plate having a central aperture formed therethrough slidable on said diametrically reduced end below said sleeve means, thrust structure threaded on said diametrically reduced end below said plate and including an upper portion projecting and slidable through said aperture and engageable with said sleeve means for applying axial thrust thereto, said thrust structure including a lower portion thereof abuttingly engageable with the side of said plate remote from said sleeve means.

4,275,976

PNEUMATIC CONVEYOR SYSTEM

Walter Sticht, Wan':hamerstr. 8, A-4800 Attnang-Puchheim, Austria

Filed Oct. 4, 1979, Ser. No. 81,869
Claims priority, application Austria, Jun. 25, 1979, 4420/79
Int. Cl.³ B65G *53/40*
U.S. Cl. 406—28 **17 Claims**



1. A pneumatic conveyor system adapted for the conveyance of assembly parts, comprising

(a) a tubular conveyor conduit having an inlet and defining a conveyance path,

(b) a pneumatically operable drive means in the conveyance path,

(c) a control for operating the drive means, and

(d) an inlet metering device associated with the conveyor conduit upstream of the drive means, the metering device including

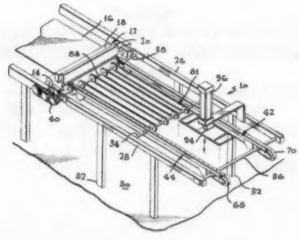
(1) a blocking mechanism responsive to the control for cyclically blocking and unblocking the conveyance path, and comprising a blocking pin movable transversely into and out of the conveyance path for blocking and unblocking conveyance through the conduit, the blocking pin being capable of retaining the assembly parts when moved transversely into the conveyance path, and an adjustment drive for moving the blocking pin.

4,275,977

APPARATUS AND METHOD FOR INDIVIDUAL BAG WORKING AND STACKING

Richard L. Joice, 20021 Merridy St., Chatsworth, Calif. 91311

Filed Jun. 11, 1979, Ser. No. 47,275
Int. Cl.³ B65G *57/04*; B65H *29/32*
U.S. Cl. 414—51 **12 Claims**



1. An apparatus for polymer bag handling comprising:

a single vacuum conveyor having first and second stations, said vacuum conveyor having an upwardly directed active surface and being positioned to receive polymer film bags on the top of said active surface from a bag-making machine;

means for connection to the bag-making machine for intermittently advancing said vacuum conveyor to receive bags as intermittently received from the bag-making machine so that bags carried thereon are intermittently ad-

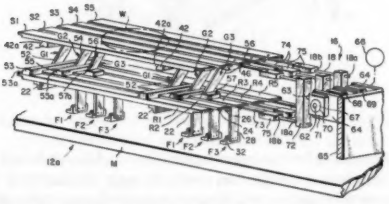
vanced onto said first station from the bag-making machine and intermittently advanced on said single vacuum conveyor from said first station to said second station; and means for maintaining vacuum on said vacuum conveyor at said first station and for terminating the application of vacuum to said second station when said vacuum conveyor is stationary.

4,275,978

TRANSPORT APPARATUS

Norman B. Brooks, 391 East St., Carlisle, Mass. 01741, and Frank P. Brooks, 5 Inverness Rd., Winchester, Mass. 01890

Filed Feb. 15, 1979, Ser. No. 12,354
Int. Cl.³ B65G *25/02, 27/08*
U.S. Cl. 414—156 **25 Claims**



1. Transport apparatus comprising
A. mounting means,
B. first rail means,
C. means connected to said mounting means for flexurally supporting the rail means relative to the mounting means,
D. first slat means,
E. second means connected to the first rail means for flexurally supporting the first slat means relative to the first rail means,
F. motive means operative to reciprocate said first rail and slat means about their supporting means out of phase with each other so that said first rail means moves along an arcuate path relative to the mounting means and said first slat means moves along an arcuate path relative to the first rail means whereby said first slat means orbits about an elliptical path relative to said mounting means, and
G. support means positioned adjacent to the first slat means in a plane which intercepts the elliptical path of the first slat means so that when an object is placed on the support means and said motive means is operative, the object is lifted from said support means and advanced relative to the mounting means incrementally along successive paths corresponding to a segment of said elliptical path.

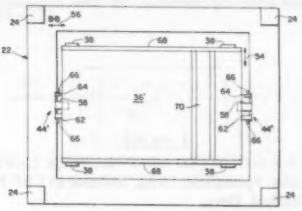
4,275,979

CONVEYOR PAN IMMOBILIZING ASSEMBLY

Robert D. Lichti, Lakewood, and Frederick D. Hock, Los Alamitos, both of Calif., assignors to Park Mobile, Inc., New York, N.Y., a part interest

Filed Jan. 30, 1978, Ser. No. 873,520
Int. Cl.³ E04H *6/08, 6/42*
U.S. Cl. 414—251 **13 Claims**

1. A conveyor pan immobilizing assembly for immobilizing a conveyor pan in a direction substantially perpendicular to the conveyed direction of the conveyor pan yet permitting movement of the conveyor pan in the conveyed direction, said conveyor pan having first sides that are substantially parallel to the conveyed direction; said assembly comprising
first and second subassemblies mounted for respective engagement with the first sides of the conveyor pan, each subassembly comprising:
a roller for engaging the first pan side;
means for rotatably mounting said roller; and
means for resiliently mounting said roller for movement in a substantially vertical direction, said roller being mounted such that the surface thereof when in engagement with the respective pan side forms an acute included angle with a vertical axis, said resilient means comprising an elongate bracket, said roller being rotatably mounted at one end of



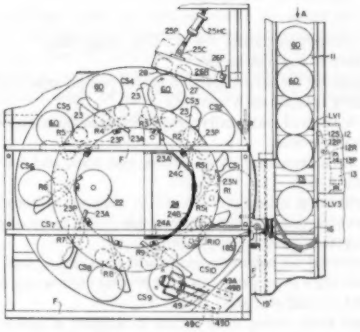
said bracket and the other end of said bracket being pivotally mounted, and spring means for resiliently urging said one end of said bracket in an upward direction.

4,275,980

APPARATUS FOR AUTOMATICALLY DEGASSING FIGAL CONTAINERS

James C. Coots, Marietta, and Muir G. Howser, Dunwoody, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Jul. 9, 1979, Ser. No. 55,804
Int. Cl.³ B65G *65/34*
U.S. Cl. 414—411 **12 Claims**



1. An apparatus for automatically degassing containers through a valve disposed in the top thereof as said containers pass along a first conveyor means into a predetermined area, said containers having index openings of a predetermined characteristic shape and openable lid in the top thereof, comprising:
second conveyor means disposed in said predetermined area;
sensing means for detecting the entrance of a container into a region adjacent said second conveyor means;
transfer means for transferring said container from said region onto said second conveyor means;
indexing means responsive to said sensing means for driving said second conveyor means;
positioning means adjacent said second conveyor means for clamping said container on said second conveyor means and for rotating said container about its vertical axis;
latch means for stopping the rotation of said container by said positioning means at a position wherein said valve on top of said container has a predetermined orientation;
degassing means for operatively engaging said valve to permit the flow of gas within said container therethrough to thereby degas said container;

means for moving said degassing means into engagement with said valve when said latch means stops the rotation of said container; and

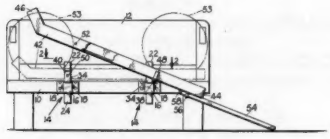
means for automatically opening a lid on the top of said container after the container has been degassed.

4,275,981

VEHICLE MOUNTED MOTORCYCLE CARRIER

Larry C. Bruhn, Springfield, Oreg., assignor to LBF Properties, Inc., Springfield, Oreg.

Filed Jan. 29, 1979, Ser. No. 7,432
Int. Cl.³ B60R 9/10
U.S. Cl. 414—462 **4 Claims**



1. A motorcycle carrier for vehicles comprising

(a) a pair of support means,

(b) mounting means arranged to mount said support means in spaced relation on a vehicle,

(c) a horizontal outwardly projecting arm on each of said support means,

(d) a main ramp supported across said arms and having a loading end,

(e) said ramp being of a length to support a motorcycle thereof and having upstanding side walls to receive motorcycle wheels therebetween,

(f) apertured ear means on one of said arms and on said ramp receiving a pivot pin to provide pivotal connection of said ramp on said one arm,

(g) said ramp being of a length to support a motorcycle thereon and having an extension beyond its pivot connection with said one arm in a direction opposite from said other arm, whereby upon tilting said ramp on its pivot means with said extension downward, a motorcycle is arranged to be wheeled up the loading end of said ramp to a point such that the combined centers of gravity of the motorcycle and ramp will cause the ramp to pivot down into support on said other arm,

(h) a cradle on said other arm for confining the ramp therebetween,

(i) releasable lock means engageable between said cradle and said ramp arranged to secure said ramp down on said other arm in a loaded position of the motorcycle,

(j) socket means on the bottom of said ramp,

(k) said socket means extending laterally across said ramp and having an opening facing said loading end,

(l) and an auxiliary ramp arranged for removable telescoping fit in said socket means for forming an extension of said main ramp,

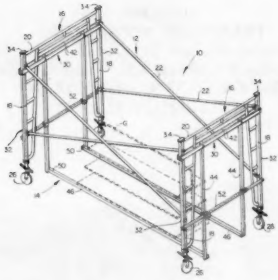
(m) said socket and auxiliary ramp having a lateral width less than the distance between said side walls of said main ramp whereby said auxiliary ramp is arranged to be stored in said main ramp when not in use.

4,275,982

APPARATUS FOR MOVING MERCHANDISE GONDOLAS

Marshall Fisco, 1154 Coleman Rd., Cheshire, Conn. 06410

Filed Jun. 4, 1979, Ser. No. 45,180
Int. Cl.³ B60P 3/00
U.S. Cl. 414—459 **19 Claims**



15. Apparatus for moving merchandise gondolas and the like and comprising a collapsible, walk-through, rolling scaffold frame assembly and a gondola carrying attachment releasably secured to said scaffold frame assembly, said scaffold frame assembly including a pair of walk-through end frames having an inverted generally U-shape, each of said end frames having a pair of transversely spaced apart axially elongated vertically extending legs, longitudinally disposed side members, means releasably connecting said side members to said end frames, said side members maintaining said end frames in transversely disposed and longitudinally spaced apart relation, and casters mounted on said end frames and supporting said scaffold frame assembly for travel along a supporting surface, said gondola carrying attachment including a plurality of horizontally disposed transversely extending cross beams, attaching means for releasably retaining at least one of said beams on each of said end frames to extend transversely thereacross and including a plurality of attaching members and means releasably securing each of said attaching members to an associated one of said legs in direct axially downwardly bearing relation thereto, gondola engaging means, and securing means for connecting said gondola engaging means to said cross beams including two pair of rigid vertically extending securing members and means for releasably retaining the securing members of each pair on said cross beams, said apparatus having elevating means for raising and lowering said gondola engaging means relative to the supporting surface and for maintaining said gondola engaging means in its raised position.

4,275,983

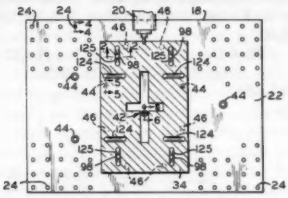
AIR FLOAT FIXTURE CLAMPING SYSTEM

Raymond A. Bergman, 107 E. Second St., Minster, Ohio 45865

Continuation-in-part of Ser. No. 924,958, Jul. 17, 1978, Pat. No. 4,179,106, which is a continuation of Ser. No. 815,676, Jul. 14, 1977, abandoned, which is a division of Ser. No. 684,725, May 10, 1976, Pat. No. 4,058,885. This application May 17, 1979, Ser. No. 40,072
Int. Cl.³ B23Q 7/00
U.S. Cl. 414—676 **33 Claims**

1. In a fluid fixture support system including a table having an upwardly facing upper surface adapted to support a workpiece fixture, a workpiece fixture having a lower surface in facing relationship with the table upper surface when the fixture is supported on the table upper surface, and means for supplying a cushion of fixture supporting pressurized fluid to the surface of the table whereby the fixture may be floatingly supported thereon, a fixture clamping system comprising: a clamp element movably mounted in said table and including a

portion thereof overhanging said table, retraction means in said table connected to said clamp element for selectively drawing at least said overhanging portion toward said table, said fixture including an elongated slot in the lower surface thereof accommodating the clamp element overhanging portion therein, said clamp element adapted to be received in said slot, said slot including shoulder means disposed beneath the overhanging portion of said clamp element when said clamp element is received in said slot such that said shoulder means will be



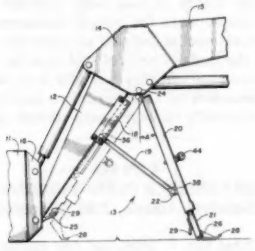
clamped by said overhanging portion when the overhanging portion is drawn toward said table, at least one opening in the lower surface of said fixture contiguous with said slot and being sufficiently large to permit said clamp element to project upwardly through said opening into said slot, whereby said clamp element and slot function to locate the fixture as it is moved over the surface of the table and enable the fixture to be immediately clamped in place by retracting the clamp element when the desired position of the fixture on the table has been reached.

4,275,984

PARKING STAND

John B. Lenertz, Chaska, Minn., assignor to Farmhand, Inc., Minneapolis, Minn.

Filed Mar. 19, 1979, Ser. No. 21,350
Int. Cl.³ E02F 3/70
U.S. Cl. 414—686 **15 Claims**



1. A parking stand for an implement comprising:

an elongated support leg pivotally secured near its upper end to a portion of said implement, said elongated support leg being extendable to a plurality of positions along its longitudinal axis and being pivotable between an operative position and a non-operative position;

means for fixing said elongated support leg in a plurality of extended positions;

interlocking connection means for retaining said elongated support leg in its non-operative position; and

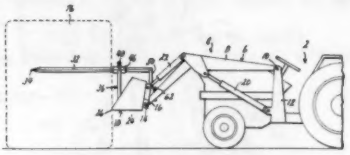
means for limiting the pivotal movement of said elongated support leg including an elongated member of fixed length having one end connected to a portion of said support leg and the other end connected with a portion of said implement.

4,275,985

HAY BALE HANDLING DEVICE

Stanley M. Schremmer, P.O. Box 143, Utica, Kans. 67584

Filed Apr. 12, 1979, Ser. No. 29,207
Int. Cl.³ E02F 3/00
U.S. Cl. 414—722 **4 Claims**



1. In combination with a tractor front end loader having a generally forwardly opening, open-mouthed scoop and means operable to vary both the elevation of said scoop above the ground and the angle of inclination of the open mouth thereof above and below horizontal, a hay bale handling device comprising:

a. a straight elongated spear pointed at its forward end, said spear being adapted to extend forwardly and rearwardly over the top of said scoop, with the forward end thereof projecting forwardly from said scoop in a direction generally parallel to the direction in which the mouth of said scoop opens,

b. front and rear legs extending generally vertically between said spear and said scoop respectively over the forward portion of said scoop and behind said scoop, and

c. attaching means operable to secure the upper and lower ends of said legs respectively to said spear and to said scoop, whereby said spear is held rigidly in the described position, said attaching means being adjustable to vary the vertical angle of said spear relative to the direction in which said scoop opens.

4,275,986

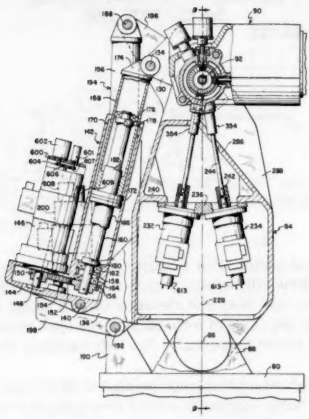
PROGRAMMABLE AUTOMATIC ASSEMBLY SYSTEM

Joseph F. Engelberger, Newtown; Torsten H. Lindbom, Brookfield; Maurice J. Dunne, Newtown; William Perzley, Weston; Wilbur N. Roberts, Newtown, and Horace L. Gardner, Ridgefield, all of Conn., assignors to Unimation, Inc., Danbury, Conn.

Division of Ser. No. 625,932, Oct. 28, 1975, Pat. No. 4,163,183.
This application Apr. 19, 1979, Ser. No. 31,463
Int. Cl.³ B25J 9/00
U.S. Cl. 414—730 **18 Claims**

1. In a programmable manipulator, the combination of, a base member mounted for rotation about a vertical axis, a first arm portion pivotally mounted on said base member for rotation about a first horizontal axis, a second arm portion mounted on the upper end of said first arm portion for movement about a second horizontal axis, a manipulator hand mounted on the outer end of said second arm portion and movable about a wrist bend axis which is perpendicular to the longitudinal axis of said second arm portion, said hand having a swivel portion on the outer end thereof which is rotatable about a wrist swivel

axis which is perpendicular to said wrist bend axis, means for rotating said first and second arm portions about their respective axes, and drive means for said hand and swivel portions mounted on said first arm portion and movable therewith.

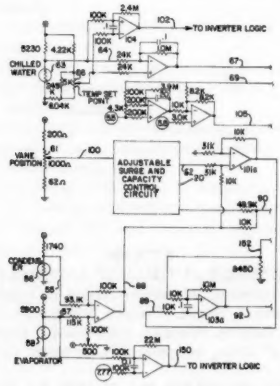


4,275,987

ADJUSTABLE SURGE AND CAPACITY CONTROL SYSTEM

Kenneth J. Kountz, Hoffman Estates, Ill., and Dean K. Norbeck, York, Pa., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 12, 1979, Ser. No. 75,042
Int. Cl.[3] F01D *17/00;* **F25B** *1/00*
U.S. Cl. 415—17 **14 Claims**



1. An adjustable surge and capacity control system for controlling the operation of a inverter driven centrifugal compressor refrigeration system comprising

means for detecting the position of the adjustable inlet vanes of a centrifugal compressor of a refrigeration system,

circuit means coupled to said detection means to provide a first output indicating vane position and a second output indicating speed deviation of the compressor from minimum Mach number based on said vane position, and

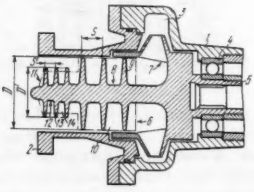
said circuit means having adjustable means to adjust said first and second output to control the operation of a centrifugal compressor without surging at all expected operating points.

4,275,988

AXIAL OR WORM-TYPE CENTRIFUGAL IMPELLER PUMP

Leonid F. Kalashnikov, ulitsa 50 let VLKSM, 2, kv. 165, Kaliningrad Moskovskaya oblast; Vladimir N. Kudiarov, Leningradskoe shosse, 2, kv. 40, Khimki Moskovskaya oblast; Georgy M. Kushnir, Kronshtadsky bulvar, 34, korpus 2, kv. 78; Anatoly S. Shapiro, Raketny bulvar, 12, kv. 7, both of Moscow; Rjury I. Konstantinov, ulitsa 50 let VLKSM, 5/16, kv. 110, Kaliningrad Moskovskaya oblast; Vadim V. Nikolaev, ulitsa Mendeleevskaya, 5, Klyazma Moskovskaya oblast, and Vladimir K. Kunets, prospekt Mira, 180, kv. 12, Moscow, all of U.S.S.R.

Filed Dec. 13, 1978, Ser. No. 968,727
Int. Cl.[3] F04D *3/02, 29/38*
U.S. Cl. 415—74 **13 Claims**



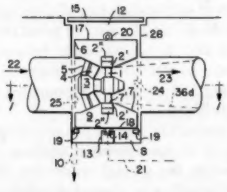
1. An axial or worm type centrifugal impeller pump, comprising: a housing; a drive shaft running through said housing; bearings in which said drive shaft is rotatably journalled; an axial impeller mounted on said drive shaft; a hub of said axial impeller; helical blades of said axial impeller fixed on said hub, said blades defining a plurality of blade channels for the liquid being handled to pass; an additional intake axial impeller mounted on said drive shaft forwardly of said axial impeller as viewed along the flow of liquid; a hub of said additional intake axial impeller; helical impeller blades fixed on said hub of said additional intake axial impeller; the outer diameter and the lead of the helix of said helical impeller blades of said additional intake axial impeller being synchronously and correspondingly smaller than the outside diameter and the lead of helix of said helical impeller blades of said axial impeller at the entry thereof; the ratio between the outside diameters of said additional intake axial impeller and said axial impeller as well as the ratio between the leads of helix of said impeller blades of said additional intake axial impeller and said axial impeller across the outside diameters of said respective impellers being selected so as to provide for high pump suction capacity.

4,275,989

REVERSIBLE PUMP-TURBINE

Francisco J. Gutierrez Atencio, 3105 Diamante, Entre Rios, Argentina

Filed Feb. 8, 1979, Ser. No. 10,406
Int. Cl.[3] F01D *5/02;* **F03D** *11/00*
U.S. Cl. 415—129 **26 Claims**



23. In a main fixed fluidic flow directing conduit spliced in two substantially coaxially spatially disposed subconduit

branches, each performing in a given specific energetic functional performance and being both connected to a main structural embodying arrangement with respective open ends defined in the peripheral walls of said embodying arrangement; the improvement comprising at least one hydromotive assembly positioned within said embodying arrangement, said hydromotive assembly being controllably-alternatively disposed in a given specific energetic functional performance in combination with one branch of said set of two spliced subconduit branches; said hydromotive assembly including a conduit having a peripheral wall defining a fluid flow circulation path alternatively-controllably disposed for said functional performance in combination with each of said two spliced subconduit branches, an energy transformation unit disposed in combination with said fluid flow assembly circulation path, said transformation unit adapted to activate fluid within said flow path when specifically performing in an energy accumulation mode or to be actuated thereby when specifically performing in an energy generation mode, said assembly conduit having a first open end and a second open end for discharging fluid entering said first open end, both said first and second open ends being configured to be alternatively-controllably positioned against each said two subconduit branch open ends defined in said embodying arrangement peripheral wall, and means on said hydromotive assembly mounting same in combination with an inner configuration of said embodying arrangement to allow rotatable displacement of said assembly between said extreme alternate positions.

4,275,990

DISC CHANNEL FOR COOLING ROTOR BLADE ROOTS

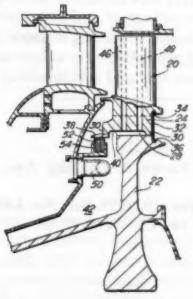
Kenneth R. Langley, Wotton-under-Edge, and John R. D. Fuller, Bristol, both of England, assignors to Rolls-Royce Limited, London, England

Filed Nov. 30, 1978, Ser. No. 965,057

Claims priority, application United Kingdom, Dec. 17, 1977, 52597/77

Int. Cl.³ F01D *5/18, 5/30*

U.S. Cl. 416—95 **7 Claims**



1. A turbine disc for a bladed rotor assembly comprising a rim, a plurality of generally axially extending slots in the rim adapted to receive the roots of rotor blades, the radially innermost surfaces of all of said slots lying at a first radius, a continuous circumferential flange integral with and projecting axially from the rim of the disc on at least one side face thereof, said flange defining a continuous circumferentially extending surface at a radius less than said first radius and being integrally connected to the disc at a radius greater than said first radius, and a continuous circumferentially extending cooling air channel open towards the radially inner side of the flange, and extending radially outwardly between the flange and the side face of the disc and intersecting and opening into and through the radially innermost surface and a portion of at least one of the flanks of each of the blade root-receiving slots whereby air entering said cooling air channel issues into said blade receiving slots below a corresponding blade root.

4,275,991

BOAT PROPELLER

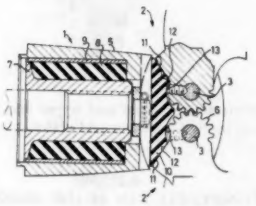
Carl U. Söderbaum, Askim, Sweden, assignor to AB Volvo Penta, Gothenberg, Sweden

Filed Jun. 14, 1979, Ser. No. 48,374

Claims priority, application Sweden, Jun. 27, 1978, 7807264

Int. Cl.³ B63H *1/24*

U.S. Cl. 416—142 **2 Claims**



1. In a propeller device for boats, comprising a hub which is designed to be fixed on a propeller shaft, and a pair of propeller blades carried by the hub and swingably journaled on the hub so that they are movable between a spread-out operating position and a folded position in which the blades extend backward in the shaft direction, said blades having intermeshing cogs thereon whereby they swing conjointly in opposite directions, said blades being disposed, under the effect of the centrifugal force when the propeller shaft rotates, to swing out from the folded position to the operating position; the improvement in which the hub has a slot immediately in front of the blades, and a single resilient damping member disposed in said slot, said damping member having separate spaced stop surfaces one of which is struck by a stop surface on one of the blades in the vicinity of the journaling of the one blade on the hub and the other of which is struck by a stop surface on the other blade in the vicinity of the journaling of the other blade on the hub in order to brake the swinging movement of the blades in the vicinity of said operating position, when the blades are swung out from their folded position, the material of said single damping member being a resilient material that extends continuously along a straight line that extends from one said stop surface on said damping member to the other said stop surface on said damping member, said stop surfaces on the damping member being inclined toward each other.

4,275,992

MODE CONTROLLED ATTACHMENT OF ROTOR MOUNTED COMPONENTS

James R. Andrews; Rodney W. Balke, and Victor L. Berry, all of Arlington, Tex., assignors to Textron, Inc., Providence, R.I.

Filed Apr. 9, 1979, Ser. No. 28,341

Int. Cl.³ B64C *7/00*

U.S. Cl. 416—146 R **14 Claims**

1. A mount for supporting a device above the lifting rotor of a helicopter having a rotor shaft, comprising:

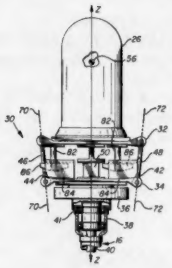
an upper plate, the device being mounted on said upper plate;

a lower plate;

means extending through the rotor shaft for supporting said lower plate and constraining said lower plate against rotation with the rotor;

two sets of links pivotally coupled between said upper and lower plates, said links defining at least two focal planes intersecting in at least one focal axis extending through a

predetermined rotational null point to control the dynamic response mode of the mounted device; and



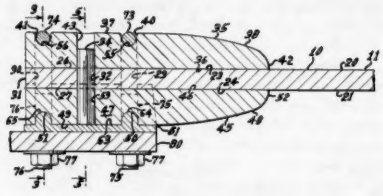
means connected between said upper and lower plates for damping motion between said plates.

4,275,993

COMPOSITE FAN BLADE ASSEMBLY

Kurt Sprengling, Jacksonville, Fla., assignor to Stanley Industrial Corporation, Jacksonville, Fla.

Filed Jul. 14, 1978, Ser. No. 924,617
Int. Cl.³ F04D 29/36
U.S. Cl. 416—207 **17 Claims**



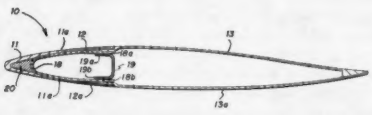
1. A fan apparatus comprising a rotor assembly including a rotor having an axis of rotation and a flat surface, a plurality of fan blade assemblies adjustably coupled to said rotor in selectable pitch positions, each of said fan blade assemblies including an elongated blade provided with top and bottom surfaces and inner and outer end portions and a longitudinal axis; an elongated shank having a lateral dimension less than the lateral dimension of said blade and integrally formed with said blade inner end portion and having top and bottom surfaces forming respective continuations of said blade top and bottom surfaces and having a longitudinal axis substantially parallel with said longitudinal axis of said blade; a first mounting member having an abutting surface generally conforming to and generally coextensive with said shank top surface and an adjoining region of said top surface of said blade inner end portion; a second mounting member having an abutting surface generally coextensive with said shank bottom surface and an adjoining region of said bottom surface of said blade inner end portion; said first and second mounting members and said shank defining a stem portion of said blade assembly, said stem portion including a circumferential groove; said rotor assembly including coupling means attached to said rotor for adjustably clamping in selectable pitch positions said stem portions between said abutting surfaces of said first and second mounting members, said coupling means including rib means adapted to be received in said circumferential groove to securely fix the relative position of said first and second mounting members and said shank, and coupling means further including a plurality of mounting saddles each having a flat side located generally beneath said shank and mounted on said rotor flat surface and an opposite side provided with a curved rib constituting a portion of said rib means, said curved rib being received in a portion of said circumferential groove, said coupling means further including a plurality of U-shaped clamps each having an intermediate curved portion constituting another portion of said rib means and disposed in substantially the remaining portion of said circumferential groove, and free end portions of each said clamp being connected to said rotor; said first and second mounting members and blade being free from any discontinuities and connections passing through said blade adjoining regions to inhibit fatigue failure of said blade.

4,275,994

ROLL FORMED BLADE STRUCTURE

William K. Underhill, Jr., Bedford, Tex., assignor to Textron, Inc., Providence, R.I.

Filed Apr. 3, 1978, Ser. No. 893,050
Int. Cl.³ B64C 11/26
U.S. Cl. 416—226 **17 Claims**



1. A main rotor blade extending along its longitudinal dimension between an outboard tip and an inboard root end from which is a connection may be made to a hub grip of a rotating mast, and including roll formed members, which comprises:

(a) a C-shaped nose spar open rearward between trailing edges thereof wherein said nose spar is flared aft in the portion of the blade adjacent the root whereby the trailing edge of said nose spar diverges from the leading edge of the blade as said nose spar extends toward said root;

(b) a channel closure secured to the inner surfaces of said trailing edges;

(c) a protective strip bonded to upper and lower outer surfaces of a forward section of said nose spar;

(d) a nose block captured by said protective strip against said nose spar;

(e) blade skins having skin portions overlying trailing upper and lower outer surfaces of said nose spar; and

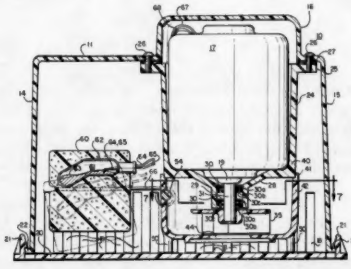
(f) body doubles bonded to trailing surfaces of said nose spar rearward of said protective strip to trap said skin portions between said nose spar and said doublers.

4,275,995

BILGE PUMP

Thomas K. Taylor, Eleven S. Coolidge Ave., Margate, N.J. 08402

Filed Jan. 10, 1979, Ser. No. 2,467
Int. Cl.³ F04B 49/04
U.S. Cl. 417—40 **8 Claims**



1. An electric motor driven bilge pump comprising an outer housing having top, side and end walls with fluid inlet openings at the lower part of the side walls,

a bottom closure wall readily detachably secured to the bottom of said outer housing,

a fixedly mounted motor housing extending downwardly within said outer housing and detachably carried by said top wall and in sealed relation to said top wall,

an electric motor in said motor housing and having a downwardly extending motor shaft,

seal means in said motor housing for said shaft for preventing access of liquid to said motor housing,

an additional seal means in said motor housing spaced from said first mentioned seal means,

said motor housing having an opening between said seal means for permitting access of liquid between said seal means for cooling,

an impeller housing detachably carried on the lower end of said motor housing in spaced relation to said bottom closure wall and having a liquid inlet opening in the bottom thereof and a liquid delivery pipe extending exteriorly of said outer housing,

an impeller on said motor shaft in said impeller housing, and

a float controlled switch in said outer housing for said electric motor and responsive to the height of the liquid in said outer housing.

4,275,996

CONTROL DEVICE FOR ADJUSTABLE FLUID PUMPS OR MOTORS

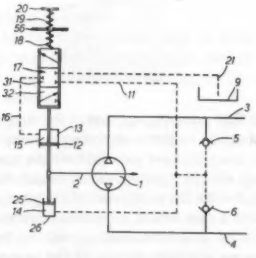
Jan Zangenberg, and Peter J. M. Clausen, both of Nordborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Jun. 13, 1979, Ser. No. 48,243

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1978, 2825827

Int. Cl.³ F04B *1/06*

U.S. Cl. 417—221 **2 Claims**



1. A control unit for an adjustable fluid pump or motor controlled by a servomember, comprising, a housing having fluid pressure supply and exhaust connections, slide valve means having a neutral blocking position with supply and exhaust positions on opposite sides thereof respectively connectable to said supply and exhaust connections, actuator means for said slide valve means having a neutral position servopiston means including an expansible chamber selectively connectable by said actuator means and said slide valve means to said supply and exhaust connections to operate said servopiston, resetting means for biasing said servopiston in a resetting direction, second valve means connected to said actuator means to provide fluid communication between said supply and exhaust connections when said actuator means is in its neutral position, said second valve means including a sleeve member in surrounding relation thereto and having a fixed position relative to said housing, said actuator means having a slide member portion sealingly cooperable with said sleeve member and having axially extending recess fluid passage means of greater axial length than said sleeve member and extending on opposite sides thereof when said actuator means is in its neutral position.

4,275,997

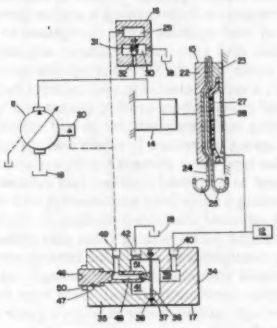
HYDRAULIC PUMP WITH PROPORTIONAL PRESSURE CONTROLLER

Richard H. Woodring; Charles H. Whitmore, both of Plainwell; Paul K. Houtman, Kalamazoo, and Thomas A. Kowalski, Paw Paw, all of Mich., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Aug. 9, 1979, Ser. No. 65,298

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—218 **7 Claims**



1. A pump comprising a variable displacement flow generating means, control means for changing the displacement rate of said flow generating means, said control means including a control chamber, a proportional valve hydraulically connected to said control chamber for changing the pressure in said control chamber, said proportional valve including a housing, separator means disposed in said housing and defining first and second chambers, a first fluid in said first chamber and a second fluid in said second chamber, said first fluid being different from said second fluid, means hydraulically connecting said control chamber with said second chamber through a variable orifice, and means to change the size of said orifice in response to the pressure in said first chamber.

4,275,998

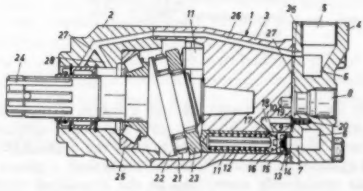
PISTON PUMP

Ralf C. E. Petersson, Hudiksvall, Sweden, assignor to Sundins Fabriker AB, Hudiksvall, Sweden

Filed Aug. 23, 1979, Ser. No. 69,115

Int. Cl.³ F04B *1/18*

U.S. Cl. 417—269 **1 Claim**



1. An improved piston pump of the type comprising a pump housing having a plurality of axially extending cylinder bores therein, a rear cover affixed to one end of said pump housing and providing a closure for one end of said cylinder bores, a bearing housing affixed to the other end of said pump housing, a plurality of pistons each supported for reciprocation in a respective of said pump housing cylinder bores, a swash plate cooperable with said pistons for effecting reciprocation of said pistons upon rotation of said swash plate, a shaft journaled in said bearing housing and operative to drive said swash plate for

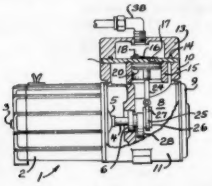
reciprocation of said pistons upon rotation of said shaft, spring means positioned in said cylinder bores and urging said pistons into engagement with said swash plate, a fluid distribution channel formed in said rear cover, a plurality of inlet passages extending between said distribution channel and respective of said cylinder bores for communication of fluid to said cylinder bores, the improvement comprising a plurality of inlet valves means each interposed between a respective of said distribution passages and said cylinder bores, and a plurality of exhaust valve means each communicating a respective of said cylinder bores with an exhaust passage formed in said rear cover, said inlet valve means each comprising a washer press fitted into a respective of said cylinder bores contiguous to the said rear cover, a first disc type valve element associated with said washer for controlling the flow through the central opening of said washer, a spring retainer in said cylinder bore, said spring means in said cylinder bore bearing against said spring retainer for positioning said spring retainer in said cylinder bore and a first valve spring interposed between said spring retainer and said first disc type valve element for urging said first disc type valve element to its closed position, said exhaust valve means each comprising a valve bore positioned in said rear cover and terminating adjacent said pump housing, a discharge passage extending in said pump housng from said cylinder bore and terminating contiguous to said valve bore, a second disc type valve associated with said discharge passage and supported in said rear cover contiguous to said valve bore for controlling the flow through said discharge passage, a guide pin affixed to said second disc type valve and extending away from said discharge passage and into said valve bore, coil spring means positioned within said valve bore and encircling said guide pin and urging said second disc type valve into its closed position with said discharge passage, the surface of said rear cover engaging said pump housing being conical with its apex being disposed contiguous to the center of said pump housing for exerting a seal pressure against said pump housing when said rear cover is affixed thereto which is greatest at the center of said pump housing.

4,275,999

AIR COMPRESSOR WITH RAMPED INTAKE VALVE

Thomas R. Hetzel, and Charles LaBelle, both of Sheboygan, Wis., assignors to Thomas Industries, Inc., Sheboygan, Wis.

Filed Aug. 27, 1979, Ser. No. 70,013
Int. Cl.³ F04B 49/00
U.S. Cl. 417—299 **8 Claims**



1. In an air compressor having a frame, a motor-driven crankshaft journalled in said frame, a cylinder supported in said frame having an open end toward the crankshaft and a closed cylinder head away from the crankshaft, a piston in the cylinder operatively connected to the crankshaft such that rotation of the crankshaft drives said piston to and fro in said cylinder, the head of said piston containing a through port and an air intake check valve which opens on the downstroke of the piston for admitting a charge of air into the cylinder through said port and closes on the upstroke of the piston to compress said charge against the cylinder head, and said cylinder head containing a through port and a discharge check valve which opens to receive said compressed charge of air on the upstroke of the piston, the improvement wherein the intake check valve includes:

a thin, flexible spring metal closure strip stationarily fastened to the piston head and having a planar portion overlying the intake port, and

the intake port having a planar valve seat thereabout against which the planar portion of the intake check valve closes on the upstroke of the piston,

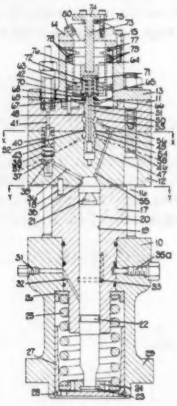
said planar portion of the closure strip being inclined to the valve seat in its "at rest" position so that the cylinder vents through the piston to atmosphere when the compressor is halted.

4,276,000

LIQUID FUEL PUMPING APPARATUS

Peter G. Warwicker, Longleavens, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 28, 1978, Ser. No. 974,041
Claims priority, application United Kingdom, Jan. 31, 1978, 3772/78
Int. Cl.³ F04B 49/06; F02M 39/00; F02D 5/02
U.S. Cl. 417—302 **6 Claims**

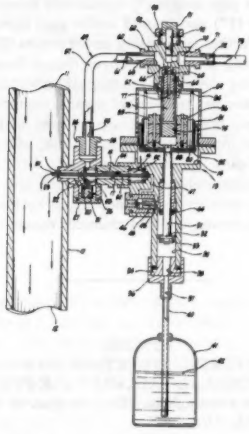


1. A liquid fuel pumping apparatus for supplying fuel to an internal combustion engine comprising a pump barrel defining a bore, a pumping plunger movable within the bore, resilient means biasing the plunger in an outward direction, tappet means engaged with the outer end of the plunger and engageable in use with a cam which imparts inward movement to the plunger, an outlet in communication with the bore for connection in use to an injection nozzle of the associated engine, a housing part which is held in sealing engagement with the end of the barrel remote from the tappet means, a first passage formed in said housing part, said first passage constituting the outlet from the bore, a second passage formed in the housing part, valve means operable to control fuel flow through said second passage, a fuel inlet in said housing portion, and a third passage connected to said inlet and communicating with said second passage on the side of said valve means remote from the bore, whereby said valve means controls the flow of fuel to the bore from said inlet, and a non-return valve in said third passage, said valve means comprising a valve member slidable within a second bore, resilient means biasing the valve member to an open position, and electromagnetic means operable to move said valve member to a closed position, said valve member being of cylindrical form having a head portion defined intermediate its ends, a seating defined in said second bore and a pair of chambers defined between the valve member and the second bore on opposite sides of the seating respectively, one of said chambers communicating with the bore containing the plunger and the other chamber communicating with the second and third passages, communication between said chambers being controlled by the valve member.

4,276,001
FLUID PUMP ASSEMBLY

Lambert Holmes, St. Louis, Mo., assignor to Dema Engineering Co., St. Louis, Mo.

Filed Jan. 15, 1979, Ser. No. 3,413
Int. Cl.[3] F04B 17/00
U.S. Cl. 417—401 7 Claims

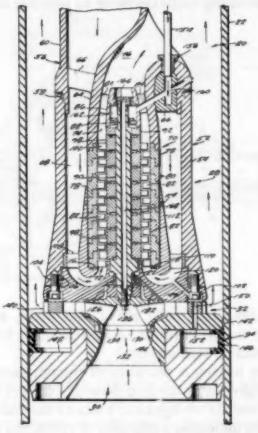


1. In a fluid pump assembly:
(a) a conduit having a pressurized flow of fluid,
(b) a body provided with a fluid chamber, and provided with a passage having an orifice connected to the conduit and the fluid chamber,
(c) pump means including an outlet and a piston rod,
(d) a fluid additive supply connected to the pump means,
(e) control means including:
1. a dump passage communicating with the fluid chamber, the dump passage having an effective cross section larger than the orifice,
2. a dump valve means for controlling flow through the dump passage to regulate the fluid pressure in the fluid chamber, and
3. motor means in the fluid chamber operatively connected to the pump means by the piston rod and to the dump valve means, and responsive to the fluid pressure in the fluid chamber, for operating the dump valve means and actuating the pump means to pump fluid additive through the outlet,
(f) the outlet of the pump means communicating with the conduit for feeding the fluid additive to the conduit,
(g) the motor means including:
1. magnetic means operatively connected to the dump valve means for opening the dump valve means as the motor means is subjected to a first predetermined fluid pressure in the fluid chamber, and for closing the dump valve means as the motor means is subjected to a second predetermined fluid pressure in the fluid chamber,
(h) the magnetic means including:
1. a permanent magnet carried by the motor means, and
2. a ferrous plunger attached to the dump valve means and actuated by the permanent magnet for operating the dump valve means.

4,276,002
TURBOPUMP UNIT FOR DEEP WELLS AND SYSTEM

James H. Anderson, 2422 S. Queen St., York, Pa. 17402

Filed Mar. 9, 1979, Ser. No. 18,882
Int. Cl.[3] F04B 17/00
U.S. Cl. 417—405 34 Claims



33. A system for pumping hot geothermal liquid from a deep well to the surface of the earth comprising:
a turbopump unit submerged in hot geothermal liquid in an enclosed and encased deep well, said unit having turbine means driving centrifugal pump means provided with a downwardly facing inlet and an outlet thereabove;
means for sealing said unit to the well casing between said pump inlet and outlet including radially expansible and contractible ring means operable by liquid under pressure to effect sealing engagement with the well casing and also frictional engagement therewith against relative vertical movement therebetween;
means mounting said sealing means to said unit for relative vertical movement therebetween;
rigid conduit means suspending said unit in said well and for supplying turbine motive liquid under high pressure from the surface for driving said pump means to pump geothermal liquid from below said unit upwardly through said casing to the casing head at a pressure above boiling;
means operable by liquid under pressure supplied from the surface after the unit has been submerged to its operational depth to urge said unit upwardly relative to said sealing means to impart a lifting force for relieving tensile stresses in said conduit means, said conduit means extending through said casing head;
means sealing said conduit means to said casing head while permitting relative vertical movement therebetween; and
means outside said casing head for exerting an adjustable upward force on the top end of said conduit means for suspending the latter and said unit in said well.

4,276,003
RECIPROCATING PISTON PUMP SYSTEM WITH SCREW DRIVE

Gerald S. Perkins, and Nicholas R. Moore, both of Altadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation of Ser. No. 774,229, Mar. 4, 1977, Pat. No. 4,145,165. This application Nov. 16, 1978, Ser. No. 961,398
Int. Cl.[3] F04B 17/00
U.S. Cl. 417—415 6 Claims

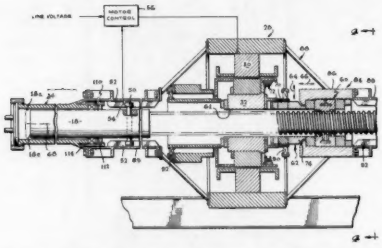
1. A pump comprising:

a cylinder having inlet and outlet means for receiving and allowing the exit of fluid;

a piston having an end portion in said cylinder and a threaded portion;

a motor having a stator and a rotor;

nut means coupled to said rotor to rotate with it, and threadably engaged with said piston threaded portion, said nut means including walls defining an internal thread, a channel extending in a helix along said walls, and pressured fluid feed means coupled to said channel to provide hydraulic fluid to said channel;



said channel having a plurality of interruptions therealong forming barriers to the free flow of fluid between channel portions that lie on opposite sides of the barrier, and said feed means including a plurality of restricted feed conduits leading to different of said channel portions to supply fluid thereto.

4,276,004

INFUSION PUMP

Andreas Hahn, Hofolding, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Biochm Gesellschaft mit beschrankter Haftung, Munich, Fed. Rep. of Germany

Filed May 31, 1979, Ser. No. 44,330

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1978, 2826033

Int. Cl.[3] **F04B** *43/14;* **A61M** *5/00*

U.S. Cl. 417—479 **5 Claims**

1. An infusion pump, comprising pump housing means, inlet port means **(23)** and outlet port means **(18)** operatively connected to said pump housing means **(2)**, pump membrane means **(3)** operatively supported in said pump housing means, inlet valve means **(13)** including inlet valve membrane means **(4)** operatively supported in said pump housing means substantially opposite said pump membrane means **(3)**, whereby the pump membrane means cooperates in its one position with the inlet valve membrane means for closing the inlet valve means, drive means arranged for operatively applying, in one position of said drive means, a force to said pump membrane means **(3)** and simultaneously to said inlet valve membrane means **(4)** for holding the inlet valve means closed and for opening said inlet valve means while substantially simultaneously imparting a suction stroke to said pump membrane means when said drive means move into the opposite position, outlet valve means **(14)** including outlet valve membrane means operatively supported in said valve housing means, chamber means **(17)** positioned in said valve housing means, said outlet valve membrane means **(14)** comprising at least one membrane portion **(15, 16)** which is operatively arranged for closing said chamber means **(17)**, access means **(20, 21)** in said pump housing means providing access to said at least one portion **(15, 16)** of said outlet valve membrane means **(14)** for ascertaining the pressure in said chamber means **(17)** by contacting said outlet valve membrane means **(14)**, riser pipe means **(7)** operatively connected to said chamber means **(17)** and to said outlet port means **(18)**, said infusion pump further comprising insert means **(5)** fitting into said pump housing means, and cover means forming part of said pump housing means for holding said insert means in said pump housing means, said insert means comprising a bore defining the pump volume, said insert means further comprising recess means forming part of said outlet valve means and said chamber means **(17)** which cooperate with said portion **(15, 16)** of said outlet valve membrane means, said insert means further forming connecting channel means between said inlet and outlet valve means and said chamber means.

4,276,005

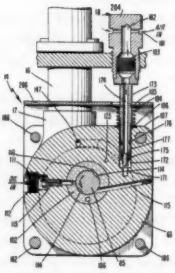
OIL FLOW METERING STRUCTURE FOR OIL SEALED MECHANICAL VACUUM VANE PUMP

Benjamin Bassan, Framingham, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Apr. 26, 1979, Ser. No. 33,629

Int. Cl.[3] **F04C** *25/02, 27/02, 29/02;* **F16N** *25/04*

U.S. Cl. 418—13 **6 Claims**

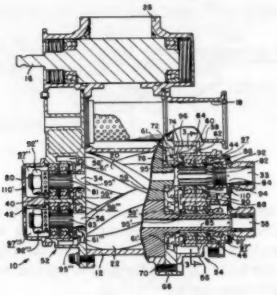


1. An oil flow path for an oil sealed, mechanical rotary vane vacuum pump having a rotor and vane cyclically driven about an axis that is eccentric to a cylinder of a stator, the stator including an inlet and outlet for the pumped gas, an oil seal between the inlet and outlet in a narrow gap between the rotor and stator, a shaft for driving said rotor, the oil path comprising a first passage leading radially to the shaft from a source of oil, said first passage having an orifice into a bore through which the shaft extends, the shaft including a recess, longitudinally aligned with the first orifice and extending only part way around the shaft so that oil is metered by the recess as the shaft is rotated, a second passage longitudinally aligned with the recess and leading tangentially from the peripheries of the shaft and the bore, means for connecting the second passage in fluid flow relation with the cylinder so oil metered to the recess bursts into the second passage and flows to the cylinder to form the oil seal and lubricate surfaces between the rotor and stator.

4,276,006
SYSTEM FOR COOLING MOTOR BEARINGS

Russell C. Perkey; David C. Thoman, both of Mishawaka, and James M. Eastman, South Bend, all of Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Nov. 7, 1978, Ser. No. 958,590
Int. Cl.[3] F01C *21/06*
U.S. Cl. 418—94 9 Claims



1. In a pneumatic motor having rotor means supported by bearing means in a housing, said rotor means being moved by a supply of hot fluid under pressure to develop an output force, said rotor means and housing conducting heat from the hot fluid into said bearing means, the improvement comprising:

means for cooling said bearing means to a temperature below said hot fluid to prevent damage to said bearing means by the heat conducted through the rotor means and housing, said means for cooling including:

seal means for attenuating the effect of hot fluid leakage from the housing along the shafts of said rotor means, said seal means including a sleeve on each end of said shafts between said bearings and housing, each of said sleeves having a projection that engages one of said bearings and a flange that engages said housing, each of said sleeve and flange being positioned on said rotors to define an annular space between the bearings and the housing, said annular space being connected to the surrounding environment, said leakage of hot fluid along said shafts flowing from the annular space into the surrounding environment to prevent said hot fluid from reaching said bearing means; and

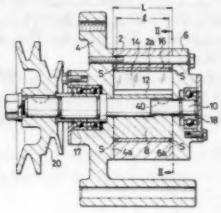
means for producing a vacuum, said vacuum being connected to said bearings for drawing air from the surrounding environment across the bearings to maintain the temperature of the bearings below that of the hot fluid.

4,276,007
ROTARY PUMP WITH CARBON VANES AND AN ALUMINUM CYLINDRICAL SLEEVE IN THE HOUSING

Hiroshi Sakamaki, Utsunomiya; Toshiyuki Maeda, Agoe; Fumihiro Ushijima, and Tadashi Saitou, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 23, 1979, Ser. No. 23,440
Claims priority, application Japan, May 24, 1978, 53/71013[U]
Int. Cl.[3] F04C *18/00, 29/00*
U.S. Cl. 418—152 10 Claims

1. In a rotary fluid pump including a rotor housing, a pair of side housings, said rotor housing and pair of side housings forming a rotor chamber, a rotor rotatably supported in said rotor chamber, a plurality of vanes slidably positioned in an equal number of grooves formed in said rotor, said vanes being made of carbon, the improvement comprising a cylindrical sleeve made of aluminum or aluminum alloy subject to anodic oxidation to obtain an oxide film on the inner peripheral surface of said sleeve; the rotor chamber having clearance spaces

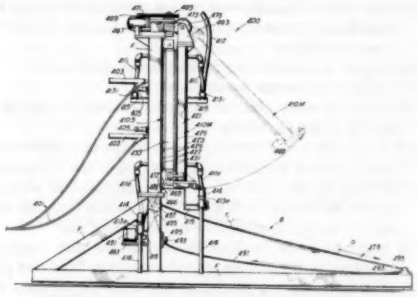


at its axial end portions and the ends of said sleeve adjacent said clearance spaces.

4,276,008
APPARATUS FOR MOLDING EXPANDABLE THERMOPLASTIC POLYMER PARTICLES

Robert L. Montgomery, and Stuart B. Smith, both of Conyers, Ga., assignors to Southeastern Foam Products, Inc., Conyers, Ga.

Division of Ser. No. 827,873, Aug. 26, 1977, abandoned. This application Aug. 31, 1979, Ser. No. 71,473
Int. Cl.[3] B29D *27/00*
U.S. Cl. 425—4 R 8 Claims



1. An apparatus for molding expandable thermoplastic polymer particles comprising a stationary frame, a stationary mold platen on said frame, a companion opposing mold platen movably mounted on said frame for movement toward and away from the stationary platen, edge rail members associated with said stationary and movable platens and defining therewith a single mold cavity, said members comprising a pair of parallel edge rail members fixedly secured to one end of said platens and a second pair of edge rail members mounted for movement toward and away from each other between said parallel members, power actuated camming means connected with said second pair of edge rail members to shift them toward and away from each other, means to move the movable platen relative to the stationary platen, means to inject expandable particles into said mold cavity, means to deliver steam to one platen only of said mold, said steam passing through the mold cavity in one direction only and expanding and fusing said particles in the mold cavity, and means to cool the mold following fusion of said particles into an integral molded mass in said mold cavity.

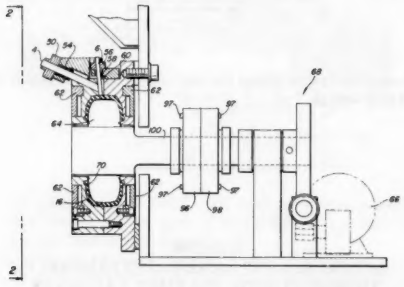
4,276,009
APPARATUS FOR MAKING CAST ANNULAR LAMINATES

Sundar L. Aggarwal, Akron; Leon F. Marker, Cuyahoga Falls; Thomas J. Dudek, Tallmadge, and Robert J. Herold, Akron, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 884,778, Mar. 8, 1978, abandoned, which is a division of Ser. No. 777,200, Mar. 14, 1977, Pat. No. 4,102,971. This application Jun. 15, 1979, Ser. No. 48,943

Int. Cl.³ B29H *5/00*

U.S. Cl. 425—130 **1 Claim**



1. In an apparatus for molding a tire in a toroidal configuration said apparatus having in combination:

(a) a closed mold cavity, the cavity having a toroidal inner surface and a toroidal outer surface which define the shape of the tire to be molded, the inner cavity surface having a common axis with the outer cavity surface;

(b) a plurality of feedports arranged to introduce at least two liquids without mixing into a toroidal cavity formed by the two surfaces;

(c) means to cure the tire formed in the mold cavity;

wherein the improvement comprises:

(d) separate reservoirs for different extendable liquids attached to the feedports;

(e) means for simultaneously injecting the different extendable liquids in metered amounts through the feedports to fill the cavity with alternate circumferential segments within the cavity, each segment extending from the inner surface to the outer surface of the cavity; and

(f) means to rotate the inner cavity surface with respect to the outer cavity surface after the cavity is filled and prior to cure to form a laminated tire from the at least two different liquids.

4,276,010
PIPE BELLER WITH FORCE DETERMINED TEMPERATURE

Kenneth B. Shartzer, Hurst, Tex., assignor to Plastic Machinery Corporation, Fort Worth, Tex.

Filed Mar. 23, 1979, Ser. No. 23,154

Int. Cl.³ B29D *23/00*

U.S. Cl. 425—143 **8 Claims**

1. An apparatus for belling a plastic pipe comprising:

a. a mandrel;

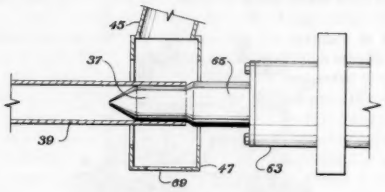
b. means for heating the mandrel;

c. means for urging the mandrel into the pipe with a predetermined force simultaneously with heating such that the mandrel will move into the pipe and form a bell only after the pipe is heated to a predetermined temperature between its memory temperature and its damage temperature,

d. means for heating the pipe simultaneously as it is applied to the mandrel;

e. means for stopping the heating of the pipe responsive to movement of the mandrel;

said mandrel being of a predetermined size and shape for the plastic pipe and being shaped to resist movement of the mandrel into the pipe to effect a bell end until the pipe is heated to a predetermined belling temperature between its memory



temperature and its damage temperature such that said pipe must be heated to said predetermined belling temperature before the predetermined force will move the pipe onto the mandrel and the bell is always formed at the correct predetermined belling temperature;

f. means for cooling the pipe; and

g. means for removing the pipe from the mandrel.

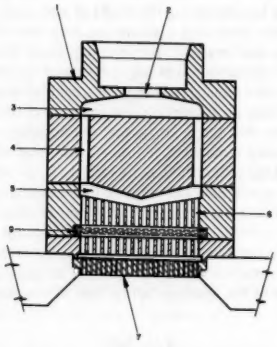
4,276,011
SPINNERETTE ASSEMBLY

Edwin J. Siegman, Pensacola, and Roy L. Yelverton, Gulf Breeze, both of Fla., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 21, 1979, Ser. No. 13,345

Int. Cl.³ A01J *17/00*

U.S. Cl. 425—198 **5 Claims**



1. A circular spinnerette assembly for extruding hardenable fluid material at substantially equal back-pressure which comprises in combination

a. a circular body member containing at the top in the central area thereof a conduit, at the bottom a spinnerette plate containing a plurality of orifices with counterbores, said orifices being arranged in concentric circular rows about the center of said circular body with the number of orifices in each row decreasing as the rows approach the center, and located within said circular body from top to bottom in the order named

b. a first tapered passageway at the exit of said conduit decreasing in volume from the center to the outer periphery of said body,

c. collector means at the exit of said first passageway and at the outer periphery of said body.

d. a second tapered passageway at the exit of said collector

means which tapers towards the center of said body and communicates with

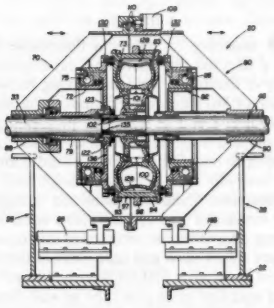
e. a plurality of distribution chambers having lengths which decrease as their position within said body approaches the center of said body and which chambers communicate with the plurality of counterbores and orifices of said spinnerette plate.

4,276,012

MOLD ISOLATOR MECHANISM FOR CENTRIFUGAL CASTING MACHINE

James H. C. Yang, Cleveland, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Mar. 7, 1980, Ser. No. 128,002
Int. Cl.³ B29C *5/04*
U.S. Cl. 425—435 **12 Claims**



1. A centrifugal casting machine of the type having a first rotatable shaft, a second rotatable shaft, a rotatable core member having an opening, at least one of said first and second shafts being adapted for moving toward and away from the other so as to extend in the opening in said core member and adjacent the other of said first and second shafts to rotatably support said core member, a first and a second mold half located on opposite sides of said core member and each adapted to move inwardly and outwardly between open and closed positions, said mold halves being rotatably supported on bearing means and in closed position being adapted to rotate with said core member and, also, defining a cavity in combination therewith, wherein the improvement comprises the addition of pluralities of mold isolator and elastic coupling means between said bearing means and said mold halves, serving concurrently as torque couplings, clamping force transmitters, rotational misalignment adjusters, and vibration dampers.

4,276,013

TOGGLE ACTION CLOSING AND LOCKING DEVICES FOR PRESSES

Cesare Bazzea, Brescia, Italy, assignor to I.M.I. Industria Macchine Idrauliche S.p.A., Brescia, Italy

Filed May 24, 1979, Ser. No. 42,185
Claims priority, application Italy, Dec. 11, 1978, 69821 A/78
Int. Cl.³ B29F *1/00*; B29C *3/00*; B30B *1/16*
U.S. Cl. 425—451.5 **3 Claims**

1. A press comprising:

(a) a stationary plate,

(b) a reaction plate spaced a fixed distance from the stationary plate,

(c) a moveable plate between the stationary and reaction plates and moveable toward and away from the stationary plate,

(d) a toggle mechanism pivotally mounted between the reaction plate and moveable plate,

(e) a first piston-cylinder device for moving the moveable plate between a position relatively far from the stationary plate to a position relatively close to the stationary plate, and

(f) a second piston-cylinder device, operable independently of the first piston-cylinder device, for activating the toggle mechanism to lock the moveable and stationary plates together,

(g) both of the piston-cylinder devices and the toggle mechanism being located in their entireties between the reaction

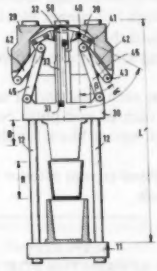


plate and the moveable plate when the moveable plate is in its closest location to the stationary plate,

(h) the toggle mechanism including a first link pivoted to the reaction plate, a second link pivoted to the moveable plate, the two links being pivoted to each other at their free ends, a crosshead moveable by the piston-cylinder devices, and a third link pivoted between the crosshead and at least one of the first and second links, and

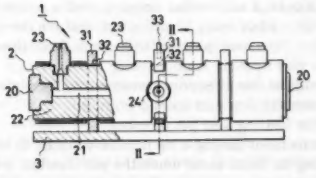
(i) when the moveable plate is at its farthest location from the stationary plate, the angle between the direction of movement of the moveable plate and the third link is greater than the angle between the direction of movement of the moveable plate and a line drawn between the pivot point of the third link to the crosshead and the pivot point of the first link to the reaction plate.

4,276,014

NOZZLE DEVICE FOR MOLDING PLASTICS

Katashi Aoki, 6037 Ohaza-Minamijo, Sakaki-machi, Hanishina-gun, Nagano-ken, Japan

Filed Apr. 4, 1979, Ser. No. 27,021
Claims priority, application Japan, Apr. 8, 1978, 53-46344[U]
Int. Cl.³ B29F *1/03, 1/08*
U.S. Cl. 425—547 **3 Claims**



1. A nozzle device for a plastic molding apparatus comprising:

a base plate;

a plurality of generally parallel support plates secured to said base plate and extending upwardly therefrom;

a hot runner block having a cylindrical shape and a fixed axial length, said hot runner block being integrally coupled to each of said support plates in spaced relation with said base plate, the axis of said hot runner block being disposed generally parallel to said base plate and perpendicular to said support plates;

a plurality of nozzles projecting radially from one side of said hot runner block, said nozzles being detachable from said hot runner block;

a sprue projecting radially from said hot runner block along a side thereof other than said one side;

a runner disposed internally of said hot runner block and providing communication between said sprue and each of said plurality of nozzles to permit molten plastic to pass from said sprue to each of said nozzles, said runner extending axially of said hot runner block and being generally centrally disposed therein;

means for bringing said nozzles into contact with gates of a mold cavity;

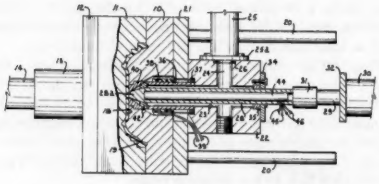
a plug disposed at each axial end of said runner of said hot runner block, each of said plugs being removable externally of said hot runner block for cleaning of said runner; and

heater bands disposed around exterior radial surfaces of said hot runner block.

4,276,015
METHOD AND APPARATUS FOR MOLDING CLAY PIGEONS AND THE LIKE

Richard R. Rogers, 73 Lakeshore West, Lake Quivira, Kans. 66106

Filed Jul. 19, 1978, Ser. No. 926,032
Int. Cl.³ B29F *1/03*
U.S. Cl. 425—548 **2 Claims**



1. In an injection molding machine having male and female mold members supported for opening and closing movement and cooperating when closed to present a mold cavity, the improvement comprising:

a passage in one of said mold members for directing molding material to said mold cavity, said passage having an inlet adapted to receive molding material and an outlet opening disposed adjacent the mold cavity; a pin member supported in said passage for movement between a first position blocking said outlet opening and a second position wherein said opening is unblocked, said pin member being smaller than said passage to permit flow therethrough when said opening is unblocked;

power means for effecting movement of said pin member between the first and second position;

means for heating said pin member;

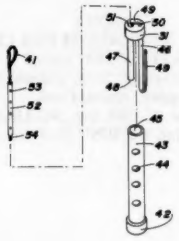
said pin member having a tip portion adapted to seat in said opening to block same when the pin member is in its first position; and

said heating means including an additional heating means located in proximity to said tip portion of said pin member for maintaining the temperature of said tip portion to a temperature greater than that of the molding material.

4,276,016
WICK DEVICE

Francis R. Lockwood, 5509 Goldenrod Rd., Louisville, Ky. 40272, and Kenneth P. Meuse, 9211 Calvacade Ave., Louisville, Ky.

Filed Mar. 28, 1979, Ser. No. 24,578
Int. Cl.³ F23D *3/18*
U.S. Cl. 431—323 **1 Claim**

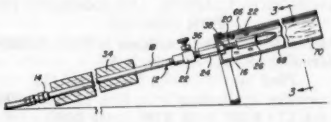


1. A wick assembly to supply a flammable fluid from a reservoir at a selected rate including; (a) reservoir means to hold a supply of flammable fluid and having an outlet aperture in the top thereof; (b) a generally cylindrical elongate dip tube having an open end and at least one perforation in the side thereof and adapted to be received in said reservoir; (c) means to secure said open end of the dip tube to and within said outlet aperture so said dip tube extends through said reservoir to permit the flammable liquid to be admitted through said perforation to the interior of said dip tube; (d) a wick feed assembly including a cap adapted to be received in said open end of said dip tube where a first open end tube extends through said cap and is adapted to receive first wick means to extend through the length of said first open end tube so said first wick is received in said dip tube with the other end of said first wick extending out of said open end first tube, (e) second elongate tube means having one closed end and adapted to be received within said dip tube with an open end received within said cap; (f) a third, cylindrical elongate tube having at least one aperture in the side thereof, and adapted to receive second wick means, and further adapted to be received within said second tube, where said first wick means extends from the end of the first tube and into the second tube whereby said flammable liquid is conducted, by wicking, from the reservoir by said first wick means through said first tube and said second tube means where said flammable liquid is thereby conducted to said third tube through said at least one aperture of said third tube to said second wick means.

4,276,017
GAS TORCH

Earl W. Julien, 700 Holland La., NE., Minneapolis, Minn. 55432

Filed Sep. 11, 1979, Ser. No. 74,498
Int. Cl.³ F23D *13/04*
U.S. Cl. 431—344 **3 Claims**



1. A gas torch for using a gaseous fuel, said torch including elongated wand defining pipe means including inlet and outlet ends, said inlet end being adapted for connection with a source of flammable gas under pressure, said outlet end including discharge means for discharging a jet of said gas, a generally

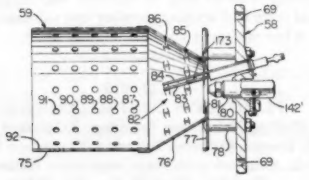
cylindrical shroud loosely telescoped over said outlet end and discharge means, a shroud support structure carried by said pipe means intermediate said inlet and outlet ends, said support structure defining a generally cylindrical recess opening outwardly at one end thereof along said pipe means toward said discharge means, one end of said shroud being removably and supportively telescoped in said recess, the other end of said shroud projecting endwise outwardly beyond said discharge means, said support structure including a generally circular base plate portion provided with a radial slot opening radially outwardly of one peripheral portion of said base plate portion, a partial cylindrical peripheral wall extending about and supported from said base plate portion and including spaced ends defining a throat therebetween aligned with the outer open end of said slot, said peripheral wall projecting outwardly of one side of said base plate portion and defining, in conjunction with said base plate portion, said recess in which said one end of said shroud is supportively telescoped, said shroud including a peripheral portion thereof at said one end at least substantially fully closing said throat, said pipe means including axially spaced abutment portions defining a narrow circumferential radially outwardly opening groove therebetween, the portions of said base plate portion defining the inner end of said slot being receivable in said groove, at least one of said pipe means abutment portions being threadedly adjustable on said pipe means for adjustably varying the width of said groove and clamping said base plate portions defining the inner end of said slot in said groove, said one end of said shroud including combustion air admitting radial openings formed therein, said radial slot, outward of said pipe means and inward of said shroud also defining combustion air inlet means.

4,276,018

MOBILE HEATER

Melvin E. Robbins, Cincinnati, Ohio, assignor to Davey Compressor Co., Cincinnati, Ohio

Filed May 30, 1979, Ser. No. 43,791
Int. Cl.³ F23D *15/02*; F02C *1/00*
U.S. Cl. 431—352 **9 Claims**



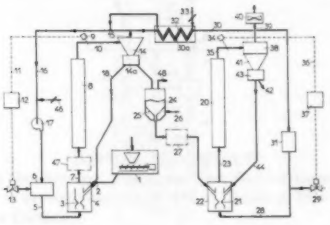
1. A burner arrangement for use with a fuel supply nozzle including a body with a longitudinal axis having a hollow truncated conical portion and a hollow cylindrical portion connected to said truncated conical portion, said truncated conical portion having an opening at each axial end with the opening at its smaller end being adapted to receive fuel from a nozzle, said truncated conical portion having the opening at its larger end communicating with said hollow cylindrical portion, said truncated conical portion having lanced ports in its wall which are disposed at a nonorthogonal angle to the bodies longitudinal axis for admitting directionalized air into the interior of said truncated conical portion and producing a rotation of the air admitted through the wall to aid in burning the fuel from the nozzle along with air supplied through said opening at the smaller end of said truncated conical portion, and said hollow cylindrical portion having air port means in its wall at spaced intervals along the length of said hollow cylindrical portion to admit air into the interior of said hollow cylindrical portion to insure complete burning of the fuel supplied through said opening at the smaller end of said truncated conical portion.

4,276,019

PROCESS FOR REGENERATING OF AN ADSORBING MATERIAL IN THE FORM OF PARTICLES CHARGED WITH AT LEAST TWO VOLATILE COMPOUNDS HAVING DIFFERENT THERMAL STABILITIES

Jean Remillieux, Versailles; Albert Rebours, Chatou; Philippe Dumortier, Sartrouville, and Paul H. L. Marchal, Garches, all of France, assignors to Air Industrie, France

Filed Oct. 30, 1979, Ser. No. 89,370
Claims priority, application France, Oct. 31, 1978, 78 30940; Feb. 5, 1979, 79 02941
Int. Cl.³ F27B *15/00*
U.S. Cl. 432—1 **17 Claims**



1. A process using two contacting columns for regenerating an adsorbent material charged with at least two volatile compounds having different thermal stabilities which comprises the steps of

(a) calcinating at least one of the volatile compounds in the adsorbent material by raising the temperature in the first column to a sufficiently high temperature and by driving the adsorbent material through the column with a stream of oxidizing gas and thereby putting the material into suspension

(b) at the outlet of the first column separating the partially purified adsorbent material from the oxidizing gases and the gaseous products desorbed from the material in the first column

(c) introducing the partially purified material from step (b) into the second contacting column and cooling it by putting it into suspension while being driven along through the column by at least a part of the gases separated in step (b) so as to readsorb on the partially purified material the gases which were desorbed from the material in step (a).

4,276,020

METHOD FOR HEATING POWDER MATERIAL AND APPARATUS FOR CARRYING OUT SAID METHOD

Kyoichi Shibuya, and Tomomi Ihara, both of Narashino, Japan, assignors to Sumitomo Cement Co., Ltd., Kanda, Japan

Filed Jul. 16, 1979, Ser. No. 57,570
Claims priority, application Japan, Aug. 4, 1978, 53-95262
Int. Cl.³ F27B *15/00*
U.S. Cl. 432—14 **8 Claims**

1. An apparatus for heating powder material, comprising:

a plurality of vertically disposed hot gas ducts for flowing hot gas streams upwardly therethrough, said hot gas ducts being separate from one another;

separate hot gas sources respectively connected to lower ends of the respective hot gas ducts for supplying hot gas to said hot gas ducts;

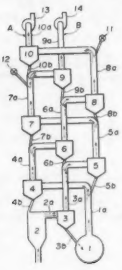
separate blowers connected to respective uppermost portions of said respective gas ducts for exhausting hot gas from said respective hot gas sources;

dust collectors respectively positioned along and in fluid communication with each of the respective hot gas ducts;

said duct collectors positioned, respectively between said respective hot gas sources and said respective blowers, each of said hot gas ducts having an uppermost dust collector in fluid communication with its respective blower

by means of the respective uppermost portion of said hot gas duct connected thereto and a second dust collector in fluid communication with and positioned upstream from said respective uppermost dust collector by means of a second portion of said respective hot gas duct, whereby hot gas can flow from each of the respective hot gas sources to the respective second dust collectors, second portions of said hot gas ducts, uppermost dust collectors, and blowers, respectively;

a plurality of separate raw material feeders, each respectively connected to the respective second portions of said hot gas ducts;



raw material ducts connecting the bottoms of said respective dust collectors of one of the hot gas ducts to respective portions of another one of said hot gas ducts positioned below said respective dust collectors of said one hot gas duct; and

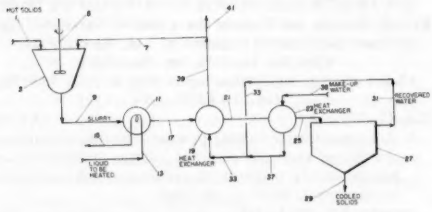
a lowermost dust collector positioned along and in fluid communication with one of the respective hot gas ducts, said lowermost dust collector having a raw material duct for discharging raw material downwardly therefrom.

4,276,021

METHOD OF RECOVERING HEAT FROM HOT GRANULAR SOLIDS

George B. Karnofsky, Pittsburgh, and Robert E. Brink, Sewickley, both of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1979, Ser. No. 64,800
Int. Cl.³ F27D *15/02*
U.S. Cl. 432—85 **5 Claims**



1. In a continuous process for the recovery of heat from a hot granular material, capable of being formed into a pumpable slurry, so as to heat a fluid, the improvement comprising:

mixing the hot granular material with preheated water to form an aqueous, heated, pumpable slurry;

passing said slurry through a first indirect heat exchanger in heat exchange relation with the fluid to be heated so as to heat the latter and partially cool said slurry;

passing said partially cooled slurry from said first indirect heat exchanger to a second indirect heat exchanger in heat exchange relation with water to preheat said water for use in said mixing and further cool said slurry;

transferring said further cooled slurry from said second indirect heat exchanger to a thickener wherein water is recovered from said slurry;

adding makeup water to said recovered water; and

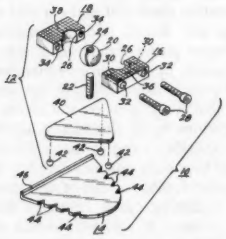
recycling said recovered water from the thickener and said makeup water for use as water to be preheated in the second indirect heat exchanger.

4,276,022

INTRA ORAL TRACING APPARATUS

John B. Della Croce, 450 Washington St., Freeland, Pa. 18224

Filed Aug. 10, 1979, Ser. No. 65,495
Int. Cl.³ A61C *9/00*
U.S. Cl. 433—71 **6 Claims**



1. An intra oral tracing apparatus comprising a tracing table and a scribing member having stylii for forming impressions in molding material disposed on said tracing table, each of the tracing table and scribing member having means for removably mounting the member in one of a patient's upper and lower jaws, and one of the mounting means having universal adjustment means, the adjustment means being provided with a locking means accessible though the patient's mouth, whereby the angle and distance between said tracing table and said scribing member may be adjusted and rigidly locked to bring said table and scribing member into substantially parallel contact when said jaws are held slightly apart.

4,276,023

FLUID FLOW CONTROL CONSOLE

Earl G. Phillips, Kalamazoo Township, Kalamazoo County, and Dee B. Ranger, Oshtemo Township, Kalamazoo County, both of Mich., assignors to Stryker Corporation, Kalamazoo, Mich.

Filed Sep. 28, 1979, Ser. No. 79,869
Int. Cl.³ A61C *1/10, 1/12, 1/02;* A61M *1/00*
U.S. Cl. 433—85 **13 Claims**

1. In a surgical and dental fluid control system for supplying liquid to a handheld pressurized gas operated tool at a surgical or dental operating site, the combination comprising:

a console remote from said operating site;

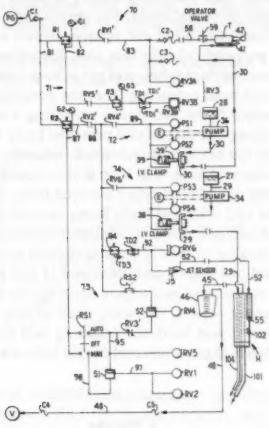
a gas pressure source and a liquid source at said console;

liquid tube means interposed between said liquid source and said tool at said operating site for carrying said liquid to said operating site;

elongated gas tube means for supplying gas at a desired pressure from said console to said tool at said operating site, said tool having means manually actuable at the operating site for changing the gas flow rate in said tube means;

means at said console responsive to a change in flow rate or gas pressure in said gas tube means due to such manual actuation, for initiating a flow of said liquid to said tool at said operating site, said change responsive means including means normally blocking liquid flow from said liquid source through said liquid tube means to said operating site and a gas circuit means for comparing the gas pressure

in said gas tube means with a reference value and unblocking said liquid tube blocking means when said gas pressure flow is below said reference value due to tool operation, said gas circuit means comprising a dual pilot valve unit including a sensing pilot connected to said gas tube means and responsive to a drop in gas pressure therein caused by operation of said tool, said dual pilot valve unit having a reference pilot and pressure reducing regulator means interposed between said reference pilot and said gas pressure source for maintaining said reference pilot at a reference pressure at a fixed level below the gas pressure in said gas tube means with said tool turned off, said dual pilot valve unit further including a valve and means responsive to actuation of said valve for unblocking said liquid tube blocking means, said sensing and reference pilots being connected in opposition to said lastmentioned valve for actuation thereof by said reference pilot upon dropping of the pressure applied to said sensing pilot due to turning on of said tool.



4,276,024

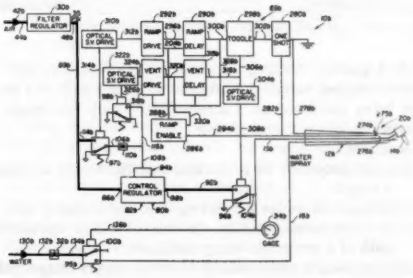
CONTROL SYSTEMS FOR DENTAL HANDPIECES

George E. Warrin, North Merrick, N.Y., assignor to Cavitron Corporation, New York, N.Y.

Division of Ser. No. 780,638, Mar. 28, 1977. This application Apr. 23, 1979, Ser. No. 32,792

Int. Cl.³ A61C *1/10*

U.S. Cl. 433—99 **11 Claims**



1. A system for controlling the flow of a drive fluid from a source along a path comprising:

A. fluid motor means operatively connected to said drive fluid path for providing variable output speed to a tool in response to the flow and pressure of said drive fluid along said path,

B. control valve means disposed in said drive fluid flow path between said source of drive fluid and said fluid motor means for controlling the flow and pressure of said drive fluid,

C. switching means coupled to said control valve means for controlling said control valve means, and

D. activating means coupled to said switching means for controlling said control valve means proportionally to the length of time of activating said activating means and maintaining the resulting tool output speed after deactivating said activating means.

4,276,025

DENTAL HANDPIECE

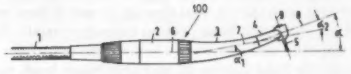
Reinhard Straihammer, Einhausen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 4, 1979, Ser. No. 100,145

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 2855796

Int. Cl.³ A61C *1/12, 1/08*

U.S. Cl. 433—105 **4 Claims**



1. In a dental handpiece having a drive motor, a grip section coupled to the drive motor and terminating in a head part having a socket for supporting a tool for rotation, said grip section having drive train means for transmitting rotational motion of the drive motor to the socket, said drive train means including at least two drive shaft sections interconnected by meshing gears, said grip section having an angle portion so that the one drive shaft section adjacent the socket extends at an angle of inclination to the other drive shaft section on the axis of the drive motor, the improvements comprising the angle of inclination being formed in at least two stages with an additional drive shaft section interposed between the one drive shaft section adjacent the socket and the other drive shaft section on the axis of the drive motor, said additional drive shaft section forming an individual angle with each of the two drive shaft sections with each individual angle being less than the angle of inclination, said grip section having a basic body portion with bores for receiving said additional drive shaft section and the other drive shaft section, and the basic body section including means for mounting the additional drive shaft section for axial displacement in one of the bores between a first and second position, said additional drive shaft section having a pair of gears disposed at each end with the gears of each pair being axially spaced apart, the other drive shaft section having a first and second gear axially spaced apart to form a pair of gears with the first gear engaging one gear of the pair of gears of the additional shaft section while the additional section is in a first position and the second gear engaging the other of said pair of gears when the additional section is in the second position, the gears of at least one of the pair of gears having different number of teeth so that a different drive ratio between the other drive shaft section and the additional drive shaft section is obtained depending on which gears are in engagement.

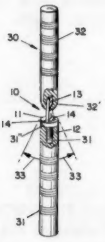
4,276,026
ANGULATION HEAD FOR DENTAL IMPLANT AND BENDING TOOL FOR SAME

Alfred E. Edelman, Haddon View South 802, 1 MacArthur Blvd., Westmont, N.J. 08108

Division of Ser. No. 937,585, Aug. 28, 1978, Pat. No. 4,217,100, which is a continuation-in-part of Ser. No. 819,119, Jul. 26, 1977, abandoned, which is a continuation of Ser. No. 559,226, Mar. 17, 1975, abandoned. This application May 13, 1980, Ser. No. 149,457

Int. Cl.³ A61C *8/00*

U.S. Cl. 433—176 **7 Claims**



1. The combination comprising an angulation head for removable attachment to a dental implant which has a hollow neck with internal threads in at least a portion of the hollow neck, said angulation head having an intermediate circular flange, a cylindrical stem depending axially from said circular flange, exterior threads on at least a portion of said stem for engagement with the internal threads in said hollow neck, and a bendable elongated head portion extending axially from said flange opposite said stem, and a bending hand tool for bending said bendable head portion of said angulation head, said bending hand tool comprising an elongated holder having a handle portion with a planar end and a socket extending axially inwardly from said flat planar end for holding the stem of said angulation head with said flange abutting said planar end, said socket having an internally threaded portion for threadedly engaging the threaded stem portion of said angulation head, and a hand manipulatable elongated bending shaft having a pair of opposite ends, one end of said bending shaft having an elongated socket extending axially inwardly therefrom which is of a size and shape for snugly receiving the bendable head portion of said angulation head.

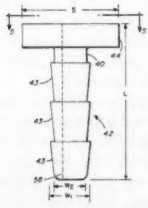
4,276,027
PARAPULPAL DENTAL RESTORATIVE PINS WITH SELF-ANCHORING ANTI-ROTATIONAL RETENTION HEADS

Leopold P. Lustig, 304 Greenwood St., Newton Centre, Mass. 02159

Filed Dec. 6, 1979, Ser. No. 100,942

Int. Cl.³ A61C *5/04*

U.S. Cl. 433—225 **11 Claims**



1. A dental restorative pin comprising a metallic principal body that is elongated on an axis forming a pin intended for insertion at one end into a hole through a surface and when so inserted to extend at the other end a distance from said surface, and at said other end a head that is flattened to embrace a plane transverse to said axis, in which said head will be disposed adjacent to but spaced from said surface when said pin is so inserted, for engaging said head in a dental restorative material when the latter is present on said surface, said head being joined to said other end of said principal body by a constricted neck located immediately between said other end and said head, said neck being thinner than the width dimension of said principal body and extending axially a small fraction of the length of said principal body, for permitting said head to be oriented around said other end relative to said axis into a plane that is not perpendicular to said axis, for adjusting said head relative to said surface when said pin is so inserted in said hole, a notch in said head extending from the periphery of said head to said principal body, and means providing a passage extending axially along one side of said principal body into substantial register with the bottom of said notch, whereby when said pin is inserted into said hole, said hole will be readily vented without displacing dental restorative material from under said head, the width of said principal body being tapered from the major transverse dimension down to a minor transverse dimension in each of a plurality of axially-limited regions extending end-to-end from said one end to said other end of said principal body, the narrow end of each said region abutting the wide end of the next succeeding region, the wide ends of said regions being oriented toward said head, for retaining said pin in a bonding material when said pin is inserted in said hole with said bonding material.

4,276,028
GUNNERY TRAINING SYSTEM

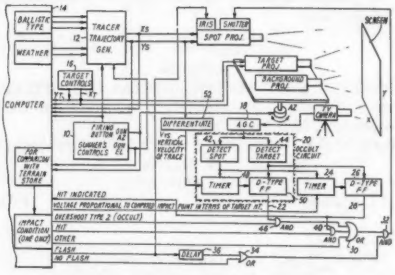
Eric C. Gwynn, Hove, England, assignor to The Singer Company, Binghamton, N.Y.

Claims priority, application United Kingdom, Sep. 27, 1978, 38 378/78

Filed Aug. 1, 1979, Ser. No. 63,024

Int. Cl.³ F41G *3/26*

U.S. Cl. 434—20 **10 Claims**



1. A gunnery training simulator system wherein a spot of a predetermined radiation is adapted to trace a path of a projectile being simulated on a screen onto which the image of a target is projected, comprising:

a screen,

a target projector for projecting onto the screen an image of a target,

a spot projector for projecting onto the screen a spot of a predetermined radiation the trace of which represents the path of a projectile being simulated,

camera means positioned to view the target image and the spot of radiation, and

electronic means connected to the output of the camera means for producing signal portions representative of the projectile trace and of the target image and for producing an output signal when the projectile trace signal portion

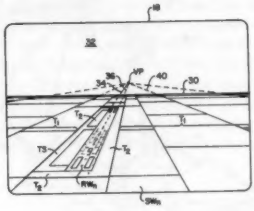
approaches to within a predetermined distance of the target image signal portion.

4,276,029

VISUAL CUE SIMULATOR

Richard D. Gilson; Marlin O. Thurston, both of Columbus; Karl W. Olson, Worthington, and Ronald W. Ventola, Columbus, all of Ohio, assignors to The Ohio State University, Columbus, Ohio

Filed May 17, 1979, Ser. No. 40,059
Int. Cl.³ G09B 9/08; H04N 7/18
U.S. Cl. 434—43 **43 Claims**



1. The method of simulating visual cues at a display surface positioned a distance, D, from an eye position, said cues representing portions of a simulative region having predetermined visual features defined by boundaries extending generally longitudinally outwardly from said eye position and by visual information having boundaries transversely oriented with respect to said longitudinal boundaries, said longitudinal and transverse boundaries being locatable by coordinates and said eye position having a simulated instantaneous height, H, and positions identified with respect to said coordinates, comprising the steps of:

generating a video raster and displaying said raster at said display surface;

generating signals representing the predetermined vertical location of a vanishing point within the periphery of said raster, those horizontal traces of said raster being located vertical distances designated, y, below said vanishing point;

generating slope signals, each representing the slope at said raster of said longitudinal boundary extensible from said vanishing point, said slope of a given longitudinal boundary representing a quotient substantially derived as the value of the transverse displacement of said given boundary from the corresponding position of said instantaneous eye position divided by a value representing said instantaneous height, H;

providing an addressible image information memory, each address thereof retaining an information signal representing said visual information;

addressing said memory to provide said information signals for a given said visual feature in correspondence with said eye position instantaneous height, H, its coordinate position and a said horizontal trace position, y;

generating boundary signals representing said longitudinal boundaries extending from said vanishing point at the slopes defined by said slope signals;

treating said combination of said boundary signals and said addressed information signals to provide video information signals;

processing said video information signals to generate video outputs; and

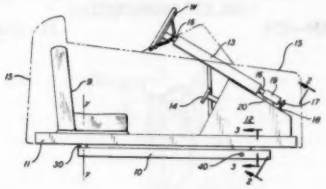
treating said video outputs to provide an image at said raster.

4,276,030

PIVOTABLE VEHICLE SIMULATOR

John G. Radice, Binghamton, N.Y., assignor to Doron Precision Systems, Inc., Binghamton, N.Y.

Filed Oct. 31, 1979, Ser. No. 89,948
Int. Cl.³ G09B 9/04
U.S. Cl. 434—62 **5 Claims**



5. Simulated vehicle apparatus, comprising, in combination: a base frame; a second frame having mounted thereon an occupant station and a simulated steering control; first means interconnecting said simulated steering control and said second frame so that movement of said steering control away from a first predetermined position rotates said second frame relative to said base frame about a substantially vertical axis; and bearing means supporting said second frame on said base frame, said bearing means being operable to slightly raise a portion of said second frame by an amount proportional to said rotation of said second frame as said second frame rotates in either direction from a second predetermined position, whereby gravitational acceleration acting on said second frame tends to restore said second frame to said second predetermined position and said steering control to said first predetermined position.

4,276,031

METHOD OF TEACHING

Phyllis E. Lueck, 2949 Roosevelt, Dearborn, Mich. 48124

Filed Mar. 24, 1980, Ser. No. 133,267
Int. Cl.³ G09B 19/00
U.S. Cl. 434—260 **6 Claims**

1. The method of teaching, which comprises successively presenting to a child a series of bags of individually different sizes, shapes, colors, materials, textures and fasteners for visual inspection and feeling;

the fasteners being selected from the group consisting of grippers, snaps, mitten clips, buckles, hooks and eyes, twist buckles, zippers, shoestring lace with eyes, buttons and loops, drawstring, button with button hole and Velcro;

successively feeling, inspecting and practice manipulating of the respective fasteners as related to the group of said fasteners which are encountered by a child in his clothing and facilitating the learning of self-dressing;

the bags being respectively round, oval, rectangular, square and triangular;

and successive visual examining by the child of each of the bags and comparing and recognizing the respective shapes, facilitating by practice the learning of different

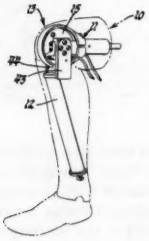
shapes as related to his clothing, and related to pre-reading.

4,276,032

KNEE JOINT FOR ANTHROPOMORPHIC DUMMY

Paul F. Woley, Ann Arbor, and Michael J. Wolanin, Milford, both of Mich.

Filed Jun. 20, 1980, Ser. No. 161,576
Int. Cl.³ G09B *23/32*
U.S. Cl. 434—274 **2 Claims**



1. A knee joint for the leg of an anthropomorphic dummy of the type used in vehicle crash testing, the knee joint comprising, in combination:

a femur member comprising at least part of the upper leg of the dummy;

a tibia member comprising at least part of the lower leg of the dummy;

a first joint member pivotably attached to the femur member and including a slide track thereon;

means defining a pair of contacting friction surfaces on the femur and first joint member perpendicular to the pivoting axis of the first joint member and effective to create frictional resistance to rotation between the first joint member and femur member;

means effective to vary the normal force between the friction surfaces and thereby vary the frictional force therebetween;

a second joint member fixed to the tibia member and slidably attached to the slide track of the first joint member for sliding movement in a direction substantially perpendicular to the tibia member;

stop means on said first and second joint members limiting forward movement of the second with respect to the first and thereby defining a normal position thereof; and

a resilient member disposed between the first and second joint members and further having a pair of opposing surfaces fixed to the first and second joint members, respectively, whereby sliding movement of the first and second joint members away from the normal position generates a restoring force opposing said movement.

4,276,033

SAILING SYSTEM

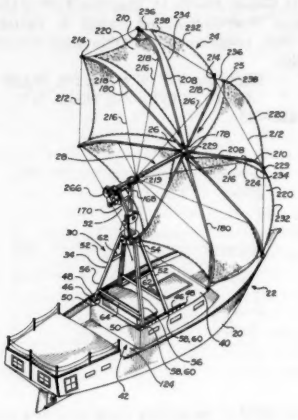
Peter G. Krovina, 12860-24th Ave. South, Seattle, Wash. 98168

Filed Jun. 18, 1979, Ser. No. 49,790
Int. Cl.³ B63H *1/00*
U.S. Cl. 440—8 **4 Claims**

1. In a wind driven dual propulsion system for a boat having a mounting frame extending upwardly from the hull of the boat and adapted to rotate about a first axis of rotation extending generally vertically from the boat, and a singular sail including a plurality of flexible sail segments disposed about a center, the improvement comprising:

an overhung, elongate axle journaled at one end to said mounting frame for rotation about a second axis of rotation extending longitudinally along the length of said axle; and

a sail support frame including a central hub member mounted on the free end of said axle and a plurality of arcuate sail supporting ribs disposed about the circumference of said hub, each of said ribs having a straight inner end portion extending radially, normally outwardly from said hub and an outer end portion curving transversely to said inner end portion and lying substantially in a plane which also includes the longitudinal axis of said axle, to



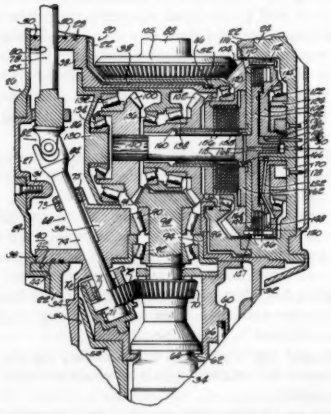
thereby collectively define a circular-convex shape for cooperatively supporting said sail segments in an overall circular-convex sail shape thereby enabling said sail to function in the manner of a conventional sail to propel the boat and also enabling the sails to rotate about the longitudinal axis of said axle to serve as an auxiliary propulsion source.

4,276,034

STERN DRIVE GEAR BOX AND CLUTCHING ARRANGEMENT

Gerald E. Kashmerick, Lindenhurst, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Apr. 27, 1979, Ser. No. 34,191
Int. Cl.³ B63H *1/14, 5/06*
U.S. Cl. 440—75 **16 Claims**



13. A stern drive unit comprising a stationary housing adapted to be fixed relative to a boat hull, a movable housing,

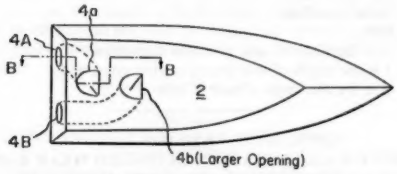
means for mounting said movable housing on said stationary housing for pivotal movement about a tilt axis which is substantially horizontal when said stationary housing is fixed to the boat hull, a propulsion leg including a rotatably mounted propeller, an input shaft in said stationary housing and transverse to said tilt axis, and output shaft journaled in said movable housing and having an axis transverse to said tilt axis, and connected to said propeller, a transfer gear supported for rotation coaxially with said tilt axis and independently of said transfer shaft, spaced first and second bevel gears mounted for rotation coaxially with said transfer gear, said first bevel gear being rotatable independently of said transfer shaft and said transfer gear, and said second bevel gear being fixed for common rotation with said transfer shaft, means for alternatively and selectively connecting said transfer gear to said bevel gears, said connecting means including a first clutch pack for selectively connecting and disconnecting said transfer gear to said first bevel gear and a second clutch pack for selectively connecting and disconnecting said transfer gear to said transfer shaft, a first gear mounted on one of said input shaft and said output shaft and in mesh with said transfer gear, and a second gear mounted on the other of said input shaft and said output shaft and in mesh with both of said spaced bevel gears.

4,276,035

DUCT SYSTEMS FOR WATER JET PROPULSION BOATS

Yoshiaki Kobayashi, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Continuation of Ser. No. 812,379, Jul. 1, 1977, abandoned. This application Jan. 19, 1979, Ser. No. 4,814
Claims priority, application Japan, Jul. 5, 1976, 51-88838
Int. Cl.³ B63H *11/04*
U.S. Cl. 440—47 **13 Claims**



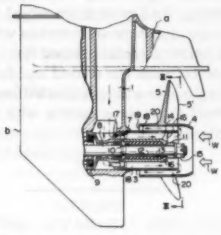
1. In combination: a boat hull capable of tilting sharply during turns, said hull having a centerline, an axis of forward motion relative to said centerline, a first longer and a second shorter water duct, a first and second exit port discharging rearwardly of the hull, said exit ports being laterally spaced from the centerline and on opposite sides of the centerline from each other, a first more forwardly and a second more rearwardly located inlet port means located on said centerline at the bottom of the hull, one located in front of the other, whereby to remain under water when said boat hull tilts sharply, said first and second water ducts respectively interconnecting said respective first and second inlet ports means and said first and second exit ports; and a first and a second water jet propulsion means disposed respectively in said first and second water ducts to move water from the respective first and second inlet port means and out the respective first and second exit ports, the cross section area defining flow resistance upstream from said first exit port being larger than the cross-section defining flow resistance upstream from said second exit port.

4,276,036

EXHAUST MEANS FOR MARINE PROPULSION UNIT

Yasuhiro Nishida, Iwata, and Yasuo Kondo, Shizuoka, both of Japan, assignors to Yamaha Matsudoki Kabushiki Kaisha, Japan

Filed Oct. 2, 1978, Ser. No. 947,634
Claims priority, application Japan, Oct. 4, 1977, 52-133981[U]
Int. Cl.³ B63H *1/14, 5/06*
U.S. Cl. 440—89 **5 Claims**



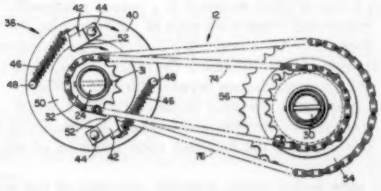
1. Marine propulsion unit comprising housing means which is formed with engine exhaust gas passage means and has a lower portion supporting propeller shaft means, propeller means mounted on said propeller shaft means and including hub means and blade means, said hub means being formed with exhaust passage means which is extending axially along the hub means and connected at one end with said exhaust gas passage means in the housing means, the other end of the exhaust passage means being opened rearwardly of the hub means, outer pipe means having a portion radially spaced apart from said hub means and extending substantially parallel with said hub portion to surround at least the rear portion of said hub means, said outer pipe means extending rearwardly beyond said other end of the exhaust passage means in the hub means, said outer pipe means having a front end which is located forwardly of trailing edge of said blade means.

4,276,037

LOAD RESPONSIVE DRIVE MECHANISM

Edward C. Ryan, Ankeny, and Jimmy J. Parker, Des Moines, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Apr. 23, 1979, Ser. No. 32,488
Int. Cl.³ F16H *5/54, 11/00;* F16D *47/04*
U.S. Cl. 474—70 **1 Claim**



1. A drive mechanism comprising: input and output shafts journaled for rotation about parallel axes, a first drive wheel fixed for rotation with the input shaft, a second drive wheel rotatably mounted on the second shaft and aligned with the first drive wheel, a third drive wheel mounted on the input shaft adjacent the first drive wheel, overrunning clutch means supported between the first and third drive wheels for constraining the third drive wheel and input shaft to rotate in unison in one direction, a fourth drive wheel supported on the output shaft for rotation in unison therewith adjacent the second drive wheel, a friction surface located between the second

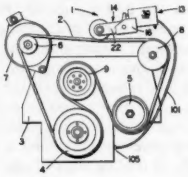
and fourth drive wheels and fixed for rotation with the fourth drive wheel, said friction surface lying in a plane perpendicular to the output shaft, said plane intersecting the overrunning clutch means, a plate member fixed for rotation with the second drive wheel and supported adjacent and parallel to the friction surface between the second and fourth wheels, means for drivingly connecting the first and second drive wheels, means for drivingly connecting the third and fourth drive wheels, means biasing the friction surface against the plate member and frictionally connecting the second and fourth drive wheels for driving the output shaft from the second drive wheel and causing the fourth drive wheel to drive the third drive wheel so the clutch means overruns when loading on the output shaft is below a predetermined level, an for providing relative rotation between the second and fourth drive wheels when the loading is above the preselected level and causing the third drive wheel to rotate in unison with the input shaft to drive the fourth drive wheel.

4,276,038

HYDRAULIC BELT TENSIONER CONSTRUCTION

Derald H. Kraft, Canton, Ohio, assignor to Dyneer Corporation, Canton, Ohio

Filed Jul. 26, 1979, Ser. No. 60,903
Int. Cl.³ F16H 7/12
U.S. Cl. 474—110 **14 Claims**



1. A hydraulic belt tensioner construction for use with the hydraulic system of a vehicle for automatically tensioning an endless belt of the drive system for the vehicle accessories, said construction including:

(a) a hydraulic cylinder having a chamber formed therein and piston rod means slidably mounted in said chamber;

(b) a partition wall mounted in the cylinder chamber forming a pair of subchambers;

(c) a pair of discs mounted in a spaced relationship on the piston rod means with each of the respective discs being located within a respective one of the subchambers;

(d) passage means formed in the piston rod means to provide fluid communication between the subchambers;

(e) a bellcrank pivotally mounted on the cylinder and engageable by the piston rod means for imparting pivotal movement to the bellcrank upon actuation of said piston rod means;

(f) idler pulley means rotatably mounted on the bellcrank and engageable with the endless belt to apply a tensioning force on the belt upon pivotal movement of the bellcrank;

(g) conduit means connecting the cylinder to the low-pressure hydraulic lubricating system of the vehicle for supplying hydraulic fluid to the cylinder chamber for slidably moving the piston rod means into engagement with the bellcrank; and

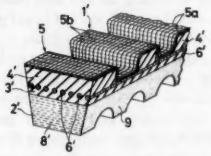
(h) check valve means controlling the flow of hydraulic fluid into and out of the cylinder chamber to maintain a constant predetermined amount of fluid pressure on the piston rod means, and accordingly, on the belt.

4,276,039

ADJUSTLESS V-BELT AND METHOD OF MANUFACTURING

Hiroshi Takano, Miki, Japan, assignor to Mitsuboshi Belting Ltd., Kobe, Japan

Filed May 3, 1979, Ser. No. 35,675
Int. Cl.³ F16G 5/08
U.S. Cl. 474—205 **15 Claims**



1. An adjustable V-belt, comprising: a compressive rubber layer; and adhesion rubber layer laminated on the upper surface of said compressive rubber layer; a group of first cogs protruding from said adhesion rubber, said first cogs having a predetermined depth and arranged at a predetermined pitch; a cover canvas covering said first cogs and roots between said first cogs; said cover canvas covering comprising an elastic canvas obtained by weaving curled nylon warps subjected to woolly treatment and ordinary wefts; whereby said cover canvas covering is elastic in one direction; rope tensile members embedded between said adhesion rubber layer and said group of first cogs with a regular pitch line in such a manner that said tensile members form substantially a cylinder and parts of said tensile members are in contact with said cover canvas, said rope tensile members having a thermal contraction stress of at least 3.5 g/denier which is the difference between a thermal contraction stress at 100° C. and that at room temperature; short fibers embedded laterally in said compressive rubber layer; a group of second cogs formed on the lower surface of said compressive rubber layer; and wherein the pitch and depth of said group of first cogs are defined by:

$1.5t < p < 3.5t$

$0.12d < t < 0.4d$,

where:

p is the pitch of said group of first cogs,

t is the depth of said group of first cogs, and

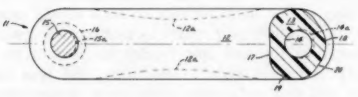
d is the thickness of said V-belt.

4,276,040

PINTLE CHAIN HAVING EXTENDED WEAR BARREL SECTION AND SPROCKET THEREFOR

Victor D. Petershack, Elm Grove, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Dec. 14, 1979, Ser. No. 103,786
Int. Cl.³ F16H 7/06; F16G 13/08
U.S. Cl. 474—229 **6 Claims**



1. A pintle chain and drive sprocket in combination, each chain link having a pin turnable in the barrel of the next preceding link, the sprocket having substantially flat radially outward faces between teeth and flat forward tooth-faces, each barrel having a flat lower face and a flat rear face for engagement respectively with an outward face and a forward face of a sprocket tooth, the angularity of the rear barrel face relative to the center plane of the link being the complement of (P&L)

where P is a selected minimum pressure angle and L is the angle of articulation of adjacent links whereby the wear life of the described combination is greater than the wear life of a similar combination having conventionally rounded barrels and tooth pockets.

4,276,041

CHAIN FOR FRICTION PULLEY TRANSMISSION

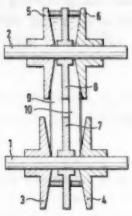
Herbert K. Steuer, Bad Homburg, Fed. Rep. of Germany, assignor to P.I.V. Antrieb Werner Reimers Kommanditgesellschaft, Bad Homburg, Fed. Rep. of Germany

Filed Nov. 7, 1979, Ser. No. 92,068

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1978, 2848166

Int. Cl.³ F16G *5/20*

U.S. Cl. 474—243 **2 Claims**



1. In a thrust piece forming a component of a chain for use in a friction pulley transmission in which the chain extends around, and circulates between, pairs of pulleys mounted on associated shafts, with one pulley of each pair being a cone pulley having a conical friction face and the other pulley of each pair being a friction pulley having a friction face which is flatter than that of the associated cone pulley, the thrust piece extending substantially transversely of the length of the chain and presenting opposed end faces via which the thrust piece bears against the friction faces of a pulley pair to effect friction force transmission between the pulley pair and the chain, the improvement wherein one said end face of said thrust piece, which contacts the friction pulley of a pulley pair, is formed to present an area of contact with the friction pulley which is reduced in relation to the area of contact between the other said end face of said thrust piece and the cone pulley of the pulley pair.

4,276,042

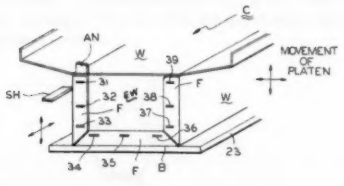
STITCHING MACHINE FOR PREFORMED CONTAINERS

John T. Bell, St. Charles, and Max E. Bender, Glen Ellyn, both of Ill., assignors to Container Corporation of America, Chicago, Ill.

Filed Oct. 11, 1979, Ser. No. 83,561

Int. Cl.³ B31B *1/68*

U.S. Cl. 493—118 **7 Claims**



1. Apparatus for forming a multiple piece container having hingedly connected first, second and third walls with corresponding flanges secured in lapping relationship to a separate end wall by securement in position of fastening means spaced along said flanges and holding said flanges to said end wall, comprising:

(a) a platen for supporting a container body having said end wall in position against said flanges;

(b) means operable upon said fastening means to cause said flanges and said end walls to be secured together;

(c) means for moving said platen in a closed path whereby the flanges of said first, second and third walls are secured to said end wall in the order named;

(d) a frame having vertical movement with said platen being mounted thereon;

(e) means for moving said platen horizontally with respect to said frame;

(f) first cam and follower means for moving said frame in vertical directions;

(g) second cam and follower means for moving said platen horizontally; and

(h) one of said cam and follower means including means for controlling said fastening means.

4,276,043

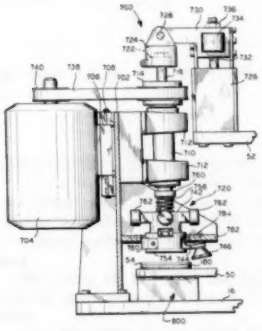
RING GROOVING APPARATUS FOR USE WITH A PACKAGING MACHINE OR THE LIKE

William R. Eddy, and Raymond C. Taylor, both of Kansas City, Mo., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 6, 1979, Ser. No. 55,233

Int. Cl.³ B31F *1/10*

U.S. Cl. 493—160 **8 Claims**



1. Apparatus for forming a groove in the generally cylindrical outer surface of a generally cylindrically shaped ring, comprising:

ring supporting means for firmly supporting one of said generally cylindrically shaped rings;

a grooving mechanism support frame positioned adjacent said ring supporting means;

grooving mechanism shaft means mounted on said grooving mechanism support frame and adapted for rotation about an axis of rotation and for reciprocation along said axis of rotation and in coaxial alignment with said ring supporting means;

grooving mechanism drive means operatively related to said grooving mechanism shaft means for rotating said grooving mechanism shaft means about the axis of rotation thereof;

reciprocating drive means operatively related to said grooving mechanism shaft means for moving said grooving mechanism shaft means longitudinally along the axis of rotation thereof from a first position distal from said ring supporting means to a second position proximate to said ring supporting means and back to said first position;

grooving head means mounted on said grooving mechanism

shaft means, said grooving head means being adapted to rotate with said grooving mechanism shaft means and to move a predetermined distance along a line parallel to said axis of rotation of and relative to said grooving mechanism shaft means;

said grooving head means further including stop means operatively engageable with said grooving mechanism support frame for limiting the longitudinal movement of said grooving head means with said grooving mechanism shaft means at a predetermined position as said grooving mechanism shaft means moves along the axis of rotation thereof from said first position to said second position;

grooving wheel means journaled on said grooving head means and adapted for generally radial reciprocating movement along a line extending generally radially from said axis of rotation of said grooving mechanism shaft means;

grooving actuator means operatively related to said grooving mechanism shaft means and said grooving mechanism head means for imparting said generally radial reciprocating movement to said grooving wheel means, said grooving actuator means being adapted to move said grooving wheel means generally radially inwardly toward said axis of rotation in response to engagement between said stop means and said grooving mechainsm support frame and further movement of said grooving mechanism shaft means toward said second position thereof into grooving engagement with said generally cylindrical outer surface of one of said generally cylindrically shaped rings on said ring supporting means, and, alternately, to move said grooving wheel means generally radially outwardly away from said axis of rotation in response to longitudinal movement of said grooving mechanism shaft means from said second position thereof to said first position thereof until said stop means disengages from said grooving mechanism support frame; and

biasing means operatively related to said grooving mechanism shaft means and said grooving head means for yieldably urging said grooving head means toward said ring supporting means relative to said grooving mechanism shaft means.

4,276,044

WATER-SOLUBLE, ULTRA-FILTRABLE POLYURETHANE ANIONOMERS AND THE USE THEREOF AS SIZES IN THE TEXTILE INDUSTRY

Dieter Dieterich, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 30, 1979, Ser. No. 89,682

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1978, 2848431

Int. Cl.³ D06L *1/12*; C08G *18/50, 18/82*; C08J *3/06*

U.S. Cl. 8—115.5 8 Claims

2. A process for sizing a textile fabric or fiber comprising treating it with an aqueous solution of a polyurethane anionomer which is the reaction product of

(a) organic diisocyanates having molecular weights of from about 160 to 300; with

(b) tri- and/or tetra-ethylene glycol;

(c)

(i) optionally other aliphatic glycols having molecular weights from about 62 to 200;

(ii) optionally other alochols with a functionality other than 2; and

(d) a glycol containing carboxyl, carboxylate, sulphonic acid or sulphonate groups and having a molecular weight below about 500;

in an NCO/OH equivalent ratio of less than about 1:1, any carboxyl or sulphonic acid groups present having been at least partly converted into carboxylate or sulphonate groups after the reaction, characterised by a content of:

(e) urethane groups, —NH—CO-O—, of from about 25 to 40% by weight;

(f) hydroxyl groups of from about 0.03 to 1.5% by weight;

(g) carboxylate groups, —COO—, and/or sulphonate groups, —SO_3—, of from about 10 to 80 milliequivalents per 100 g;

(h) tri- and/or tetra-ethylene glycol units, —(O—CH_2C-H_2—)$_{3-4}$, chemically incorporated into said polyurethane anionomer, of from about 10 to 40% by weight; and

(i) up to about 5 mole % of component (c) (ii) based on the total quantity of components (b), (c), (i) and (d).

4,276,045

DYEING AND PRINTING OF CELLULOSIC TEXTILE MATERIAL

Werner Juenemann, Bad Durkheim; Gunther Lamm, Hassloch, and Hermann Loeffler, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

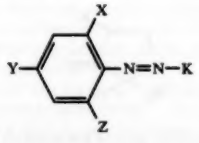
Filed Jun. 30, 1980, Ser. No. 164,006

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1979, 2930919

Int. Cl.³ C09B *29/00*

U.S. Cl. 8—471 3 Claims

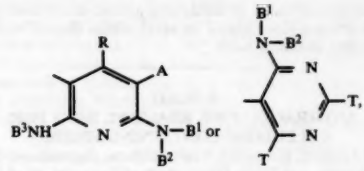
1. A process for dyeing and printing cellulosic textile material, comprising contacting said cellulosic textile material with a swelling agent and a dye wherein the dye used is a compound of the general formula I



I

where

K is a radical of the formula



one of the radicals X and Y is a C_2–C_{19}-carboxylic acid ester group, a C_3–C_{19}-carboxamide group, a C_4–C_{18}-sulfonamide group, a C_4–C_8-alkylsulfone group, a C_6–C_8-arylsulfone group or a sulfonic acid aryl ester group and

the remaining substituents X, Y and Z are hydrogen, bromine or methyl and

Y may also be nitro,

A is cyano or carbamyl,

B^1, B^2 and B^3 independently of one another are aliphatic, cycloaliphatic, araliphatic or aromatic radicals,

is a saturated heterocyclic radical,

R is hydrogen or C_1–C_3-alkyl,

one of the radicals T is a radical of the formula

and the other radical T is hydrogen, C_1–C_4-alkyl or phenyl.

4,276,046

PROCESS FOR DYEING POLYESTER FIBRES OF FIBRE MIXTURES CONTAINING THEM

Udo-Winfried Hendricks, Odenthal-Voiswinkel, and Karlhans Jakobs, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 15, 1979, Ser. No. 39,126

Claims priority, application Fed. Rep. of Germany, May 17, 1978, 2821494

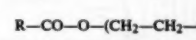
Int. Cl.³ D06P *1/613, 1/667, 3/36*

U.S. Cl. 8—532 3 Claims

1. Process for dyeing woven goods and knitted goods of polyester fibres or fibre mixtures containing polyester fibres with disperse dyestuffs in an aqueous liquor at temperatures of 95°–140° C., wherein an aqueous formulation which contains

(a) 10–50% of lecithin,

(b) 5–40% of an oxyethylated carboxylic acid of the general formula

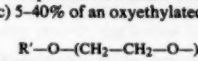


in which

R represents a saturated or unsaturated alkyl radical with 11–21 carbon atoms and

n represents a number between 4 and 12,

(c) 5–40% of an oxyethylated alcohol of the general formula



in which

R′ represents a saturated or unsaturated alkyl radical with 12–20 carbon atoms and m represents a number between 10 and 30, and

(d) 0–20% of an alkanol with 1–3 carbon atoms, of a glycol

with 2–4 carbon atoms or alkyl ethers thereof with 1–4 carbon atoms, or of diethylene glycol, triethylene glycol or tetraethylene glycol or alkyl ethers thereof with 1–4 carbon atoms, is used.

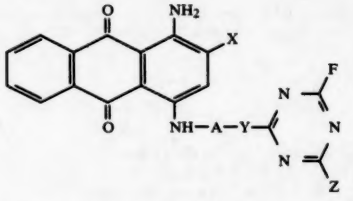
4,276,047

ANTHRAQUINONE REACTIVE DYES FOR CELLULOSE-CONTAINING FIBERS

Seiichi Imahori, Kawasaki; Toshio Hihara, Sagamihara; Tomio Yomeyama, and Takao Hirota, both of Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Apr. 18, 1980, Ser. No. 141,375
Claims priority, application Japan, May 14, 1979, 54-58970
Int. Cl.³ D06P *3/82*
U.S. Cl. 8—532 **2 Claims**

1. A dye of the formula



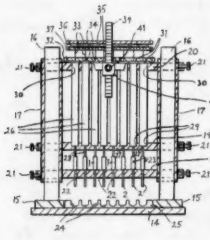
wherein A represents a phenylene group, Y represents a group —NH— or —C_2H_4O—, X represents a carbamoyl group which may be substituted with a lower alkyl group or a lower alkoxy-lower alkyl group, a sulfamoyl group which may be substituted with a lower alkyl group or a lower alkoxy-lower alkyl group; a halogen atom or a cyano group, and z represents an amino group, a mono- or di-alkylamino group having 1–6 carbon atoms in total, an anilino group, a lower alkoxy group or a group —$O(R^1O)_n$—R^2 in which R^1 represents an ethylene group or a propylene group, R^2 represents a methyl group or an ethyl group and n is an integer of 1–5.

4,276,048

MINIATURE REACTION CONTAINER AND A METHOD AND APPARATUS FOR INTRODUCING MICRO VOLUMES OF LIQUID TO SUCH A CONTAINER

David H. Leaback, Radlett, England, assignor to Dynatech AG, Zug, Switzerland

Filed Jun. 14, 1979, Ser. No. 48,375
Int. Cl.³ B01L *3/02*; G01N *33/48, 33/50*
U.S. Cl. 23—230 R **6 Claims**



3. A method of simultaneously conducting a multiplicity of chemical reactions with micro volumes of liquids, comprising the steps of:

(a) disposing a multiplicity of reaction containers in substantially upright positions in a predetermined array, each said container including a tubular reaction chamber having an inlet tube at one end of said chamber substantially coaxial therewith, said inlet tube being of smaller diameter than said chamber, being in the nature of a capillary tube and being made from non-wettable material,

(b) simultaneously dipping said inlet tubes of said containers successively into a plurality of liquids,

(c) at each dipping step, simultaneously applying suction to the ends of the said reaction chambers opposite their inlet tubes to suck precise micro volumes of each said liquid into said inlet tubes and form successive coherent threads of said liquids in said inlet tubes,

(d) simultaneously removing said inlet tubes from the last one of said liquids sucked into said inlet tubes, and

(e) simultaneously applying further suction to said reaction chambers in at least one stage to control successive introduction of said threads into said reaction chambers and consequent mixing of said liquids within said reaction chambers.

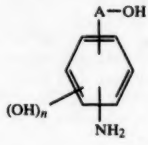
4,276,049

METHOD FOR THE DETERMINATION OF AN AMINO OR AMINOSULPHONIC ACID

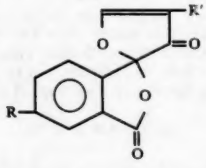
Dieter Gillessen, Pratteln, and William Lergier, Kaiseraugst, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 8, 1979, Ser. No. 92,315
Claims priority, application Switzerland, Nov. 10, 1978, 11589/78
Int. Cl.³ G01N *33/68*
U.S. Cl. 23—230 B **8 Claims**

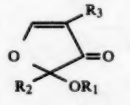
1. A method for the determination of an amino or aminosulphonic acid of the general formula



wherein A is CO or SO_2 and n equals 0, 1 or 2 in urine, plasma or serum, which method comprises reacting a urine sample or an albumin-free plasma or serum sample under strong acidic conditions with a reagent selected from the group consisting essentially of a compound of the formula



wherein R is hydrogen, halogen, lower alkyl or lower alkoxy and R′ is lower alkyl or aryl; and a compound of the formula



wherein R_1 is lower alkyl, phenyl lower alkyl; R_2 is phenyl or substituted phenyl; and R_3 is substituted or unsubstituted phenyl, naphthyl or indolyl, and o-phthaldialdehyde; and subsequently carrying out a photometric measurement.

4,276,050

METHOD FOR SYSTEMIC ENDOTOXIN DETECTION

Joseph R. Firca, Vernon Hills, Ill., and Jon A. Rudbach, Missoula, Mont., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Jan. 10, 1980, Ser. No. 110,872
Int. Cl.³ G01N *31/08, 33/92*
U.S. Cl. 23—230 B 4 Claims

1. A method for detecting endotoxins in body fluids comprising:

(a) unmasking endotoxins in the body fluid;

(b) separating the unmasked endotoxins from the body fluid by affinity chromatography; and

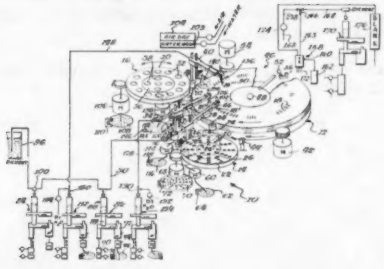
(c) detecting the endotoxins.

4,276,051

SYSTEM AND PROGRAM FOR CHEMICAL REACTION OBSERVATION WITH A MOVING PHOTOMETER

Guenter Ginsberg, Miami, Fla., and Thomas Horne, Harpenden, England, assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Jan. 28, 1980, Ser. No. 115,734
Int. Cl.³ G01N *1/14, 35/06*
U.S. Cl. 23—230 R 57 Claims



1. A method of testing samples comprising:

A. arranging a first plurality of samples into a sequence of sample positions for sequential testing;

B. moving a predetermined one of said sequenced sample positions to a first sample pick up location;

C. picking up at least a first sample aliquot in the first sample pick up location and dispensing the aliquot into a reaction vessel;

D. moving at least one predetermined reagent position from one of a plurality of first reagent positions containing a reagent to a first reagent pick up location;

E. picking up a predetermined aliquot of said reagent in the first reagent pick up location and dispensing said reagent aliquot into said reaction vessel;

F. testing at least the resulting combination of sample and reagent aliquots in said reaction vessel; and

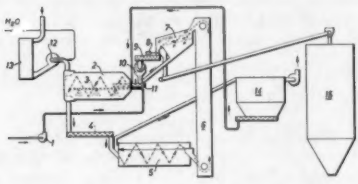
G. interrupting said sequential testing by picking up an aliquot of an auxiliary sample from a second pick up location separated from said sequenced sample positions and dispensing said auxiliary aliquot into a reaction vessel.

4,276,052

METHOD OF CRYSTALLIZING ALUMINIUM SULPHATE SOLUTIONS TO FORM DUST-FREE GRANULES HAVING UNIFORM GRAIN SIZE

Egon Boisen Schmidt, Ekeby; Josef K. S. Zechner, and Gösta M. Frang, both of Helsingborg, all of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Continuation of Ser. No. 803,455, Jun. 6, 1977, abandoned. This application Mar. 16, 1979, Ser. No. 21,205
Claims priority, application Sweden, Jun. 10, 1976, 7606601
Int. Cl.³ B01D *9/02*
U.S. Cl. 23—301 12 Claims



1. A method of crystallizing a solution of aluminium sulphate, consisting essentially of:

a. maintaining a bed of aluminium sulphate in a rotating drum, the length of which drum is considerably larger than its diameter,

b. maintaining a temperature of 70°–95° C. in the said bed,

c. applying to the said bed a solution of aluminium sulphate having a temperature of 105°–115° C. and a concentration of 14.5–16.8% by weight of Al_2O_3, to thereby crystallize aluminium sulphate from said solution onto said bed of crystalline aluminium sulphate,

d. discharging crystalline aluminium sulphate product from said drum,

e. grinding the coarser part of said discharged crystalline aluminium sulphate product,

f. recycling crystalline aluminium sulphate product to the drum, in an amount of 40–200% by weight of the solution added to said drum, to maintain said bed,

g. passing air having a temperature of less than about 50° C. through the said drum to remove moisture and heat evolved by crystallization of said solution on said bed in said drum,

h. increasing the weight percentage of Al_2O_3 in the obtained product by 0.4 to 1.5% above that of the starting solution and

i. air cooling to produce an aluminium sulphate product which has more than 75% of its weight present in the crystalline state and which contains about 15.0–18.0% by weight of Al_2O_3 in the form of granules of crystal agglomerates having an essentially uniform grain size, a characteristic appearance, and good storage properties, and

j. recovering the said aluminium sulphate crystalline agglomerates from said cooling step.

4,276,053

FUEL COMPOSITION AND METHOD FOR ITS PREPARATION

Christopher J. Veal, London, and Derek R. Wall, Farnham, both of England, assignors to The British Petroleum Company Limited, London, England

Filed Dec. 4, 1979, Ser. No. 100,215
Claims priority, application United Kingdom, Dec. 13, 1978, 48364/78
Int. Cl.³ C10L *1/32*
U.S. Cl. 44—51 9 Claims

1. A uniformly dispersed, stable fuel dispersion containing 15 to 55% by weight of SRC particles, the size of the majority of the particles being in the range 1 to 10 micron, in a medium consisting essentially of a gas oil and/or a heavier petroleum

fraction, the percentage being expressed as a percentage by weight of the total weight of the dispersion.

4,276,054

COAL-OIL SLURRIES CONTAINING A SURFACTANT

Irving R. Schmolka, Grosse Ile, and Joseph H. Y. Niu, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 19, 1979, Ser. No. 105,422
Int. Cl.³ C10L *1/18, 1/32*
U.S. Cl. 44—51 **10 Claims**

1. A combustible fuel slurry comprising solid particulate carbonaceous material, liquid hydrocarbon fuel, and a minor slurry suspension stabilizing amount of a polyoxyethylene-polyoxypropylene copolymer which corresponds to the formula:

$$Y[(C_2H_4O)_m(C_3H_6O)_nH]_x$$

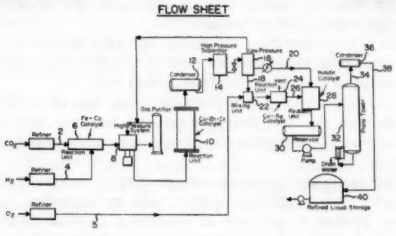
wherein Y is the residue of an organic compound having from about 1 to 6 carbon atoms and containing x reactive hydrogen atoms in which x has a value of at least one, m has a value such that the oxyethylene content of the molecule is from about 10 to 40 weight percent and n has a value such that the total molecular weight of the polyoxyalkylene groups is from about 2000 to 6000.

4,276,055

NOVEL FUEL COMPOSITION AND THE PROCESS OF PREPARING SAME

James P. H. Huang, 3-4, Alley 16, La. 64, Sec. 2, Chung Shen Rd., Chung Ho City, Taiwan

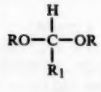
Continuation-in-part of Ser. No. 72,682, Sep. 5, 1979, abandoned. This application Sep. 24, 1979, Ser. No. 78,059
Int. Cl.³ C10L *1/02*
U.S. Cl. 44—53 **16 Claims**



1. A fuel composition comprising:

(a) from about 40 to 95% by volume of a primary alcohol having 1 to 4 carbon atoms;

(b) from about 5 to 60% by volume of a compound having the general formula



wherein R is $-CH_3$, $-C_2H_5$, $-C_3H_7$ or $-C_4H_9$, and R_1 is hydrogen or $-CH_3$; and

(c) from about 0.001 to 1% by volume of an aldehyde having the general formula

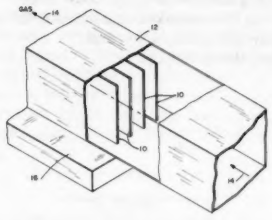
wherein R_2 is hydrogen, $-CH_3$, or $-C_2H_5$.

4,276,056

METHOD OF REMOVING PARTICULATE MATTER FROM PRECIPITATOR PLATE

Hajrudin Pasic, Sarajevo, Yugoslavia, and George Herrmann, Los Altos, Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Aug. 27, 1979, Ser. No. 69,903
Int. Cl.³ B03C *3/76*
U.S. Cl. 55—13 **2 Claims**



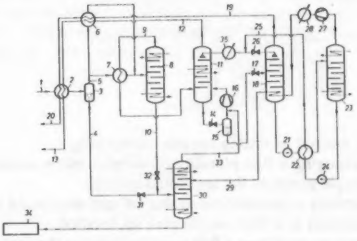
1. A method of removing particles from a plate such as a collecting plate of an electrostatic precipitator comprising the step of applying tensile loads to said plate so as to introduce high frequency stresses in said plate whereby particulate layers are broken into patches and dislodged from the surface of said plate with minimal reintroduction of the particles back into a fluid stream flowing past said plate.

4,276,057

PROCESS FOR TREATING PRESSURIZED GASES TO REMOVE UNWANTED COMPONENTS

Hans Becker, Munich; Peter Grimm, Pullach; Gerhard Ranke, Pöcking, and Dieter Roth, Unterhaching, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Hollriegelskreuth, Fed. Rep. of Germany

Filed Jun. 25, 1979, Ser. No. 51,359
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1978, 2848498
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—40 **13 Claims**



1. A process for treating an incoming gaseous mixture under pressure which includes methane, ethane, hydrogen, nitrogen and unwanted components of C_3, C_4 and C_5 higher hydrocarbons, hydrogen sulphide and carbon dioxide, said process comprising fractionating at a pressure between the critical pressures of the individual hydrocarbon constituents and the lowest critical pressure of the liquid mixtures formed during fractionation such gaseous mixture to remove at least minor portions of higher hydrocarbons, hydrogen sulphide and carbon dioxide in a bottom product, scrubbing overhead product from said fractionation step to remove in a suitable solvent a substantial remainder of C_3, C_4 and C_5 higher hydrocarbons, hydrogen sulphide and carbon dioxide from said overhead

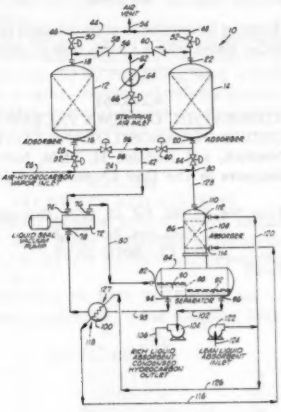
product to give a gaseous mixture essentially free of said unwanted components.

4,276,058

PROCESS AND APPARATUS FOR RECOVERING HYDROCARBONS FROM AIR-HYDROCARBON VAPOR MIXTURES

Harold L. Dinsmore, Tulsa, Okla., assignor to John Zink Company, Tulsa, Okla.

Filed Aug. 26, 1980, Ser. No. 181,429
Int. Cl.³ B01D *53/04, 53/14*
U.S. Cl. 55—48 **29 Claims**



1. An improved process for recovering hydrocarbons from an inlet air-hydrocarbon vapor mixture comprising the steps of:

(a) flowing said inlet mixture through a first bed of solid adsorbent having an affinity for hydrocarbons so that hydrocarbons are adsorbed on said bed and a residue gas stream comprised of substantially hydrocarbon-free air is produced;

(b) venting said substantially hydrocarbon-free air to the atmosphere;

(c) evacuating a second bed of solid adsorbent having hydrocarbons adsorbed thereon by subjecting said bed to pumping with a vacuum pump so that a major portion of said hydrocarbons are desorbed from said bed and a hydrocarbon-rich air-hydrocarbon mixture is produced;

(d) dividing a flow of a liquid absorbent having an affinity for hydrocarbons into a first portion and a second portion;

(e) passing the first portion of said liquid adsorbent in heat exchange relationship with a seal liquid used by said vacuum pump so that said seal liquid is cooled and said first portion of said liquid absorbent is heated;

(f) contacting the air-hydrocarbon mixture produced in step (c) in an absorber with the heated first portion of said liquid absorbent produced in step (e) so that a portion of the hydrocarbons are removed therefrom and a residue gas stream comprised of air and a portion of the hydrocarbons is produced;

(g) combining said residue gas stream produced in step (f) with said inlet air-hydrocarbon mixture of step (a) so that hydrocarbons contained therein are adsorbed on said first bed of solid adsorbent; and

(h) periodically changing the flow pattern of said inlet air-hydrocarbon mixture and changing the bed of solid adsorbent being evacuated so that when the bed through which the inlet air-hydrocarbon mixture is flowing becomes loaded with adsorbed hydrocarbons, the inlet air-hydrocarbon mixture is caused to flow through the bed which has just been evacuated.

22. Apparatus for recovering hydrocarbons from an air-hydrocarbon vapor mixture comprising:

(a) a pair of adsorbers containing beds of solid adsorbent having an affinity for hydrocarbons and having first and second connections on opposite sides of said beds;

(b) first conduit means connected to the first connections of said adsorbers for conducting said air-hydrocarbon vapor mixture to said adsorbers and for evacuating said adsorbers;

(c) valve means disposed in said first conduit means for selectively causing said air-hydrocarbon vapor mixture to flow through one or the other of said adsorbers;

(d) second conduit means connected to the second connections of said adsorbers for conducting residue gas exiting said adsorbers to the atmosphere;

(e) second valve means disposed in said second conduit means for selectively causing the second connections of one or the other of said adsorbers to be open to the atmosphere;

(f) a vacuum pump having a suction connection, a discharge connection and a seal liquid inlet connection;

(g) third conduit means connected between the suction connection of said vacuum pump and the first conduit means connected to said adsorbers;

(h) third valve means disposed in said third conduit means for selectively communicating one or the other of said adsorbers with the suction connection of said vacuum pump;

(i) an absorber for contacting an air-hydrocarbon vapor mixture with a liquid absorbent, said absorber having an air-hydrocarbon vapor mixture inlet connection, a residue gas outlet connection, a lean liquid absorbent inlet connection, a heated liquid absorbent inlet connection, and a rich liquid absorbent outlet connection;

(j) fourth conduit means connected between the air-hydrocarbon vapor mixture inlet connection of said absorber and the discharge connection of said vacuum pump;

(k) fifth conduit means connected between the residue gas outlet connection of said absorber and said first conduit means;

(l) a heat exchanger for cooling a seal liquid used in said vacuum pump, said heat exchanger having a seal liquid inlet connection, a cooled seal liquid outlet connection, a liquid absorbent inlet connection and a heated liquid absorbent outlet connection;

(m) a source of liquid absorbent having an affinity for hydrocarbons;

(n) sixth conduit means connected between said source of liquid absorbent and the liquid absorbent inlet connection of said heat exchanger;

(o) seventh conduit means connected between the heated liquid absorbent outlet connection of said heat exchanger and the heated liquid absorbent inlet connection of said absorber;

(p) eighth conduit means connected between said fourth conduit means and the seal liquid inlet connection of said heat exchanger;

(q) ninth conduit means connected between the cooled liquid outlet connection of said heat exchanger and the seal liquid input connection of said vacuum pump.

4,276,059

DEAERATOR FOR PULP STOCK

Jacek J. Macierewicz, Calgary, Canada, assignor to Elast-O-Cor Products & Engineering Limited, Canada

Filed Aug. 9, 1979, Ser. No. 65,201
Claims priority, application Canada, May 23, 1979, 328115
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—52 **18 Claims**

1. A deaerator for removing gases from complex liquids such as pulp slurries comprising an elongated tubular body adapted to be disposed in a generally horizontal position and having an inlet end and an exit end for the flow of liquid therethrough, a

chamber adjacent the exit end for accumulating gases therein and a gas removal vent associated with said chamber, a set of longitudinally extending laterally spaced apart baffles in a lower portion of said tubular body disposed generally vertically and between which a main portion of the liquid flows, a set of lateral baffles extending across the interior of the tubular body and projecting above the longitudinal baffles and spaced apart along said tubular body such that the spaces between the longitudinal baffles communicate directly with the spaces between the lateral baffles, the lateral baffles being spaced from a top wall of the tubular body to define therebetween a flow channel along which bubble-containing liquid is guided toward the chamber, the longitudinal baffles creating low velocity regions in the liquid adjacent the upper portions of the longitudinal baffles which promote the rise of gas bubbles upwardly, the lateral baffles being adapted to catch and skim off the rising bubbles and to direct same therebetween into said flow channel.

15. A method of removing gases from liquids such as pulp slurries including: flowing the liquid through an elongated tubular body disposed in a generally horizontal position from

an inlet end to and through an exit end thereof, accumulating gases escaping from the liquid in a chamber adjacent the exit end and venting the gases which accumulate therein, the improvement comprising passing a main portion of the liquid flow along and between a set of spaced apart longitudinally extending vertically arranged baffles in a lower portion of said tubular body, the longitudinal baffles creating low velocity regions in the liquid adjacent the upper portions of the longitudinal baffles which promotes the rise of gas bubbles upwardly, there being a set of lateral baffles extending across the interior of the tubular body and projecting above the longitudinal baffles and spaced apart along said tubular body with the spaces between the longitudinal baffles being in direct fluid communication with the spaces between the lateral baffles, the lateral baffles being spaced from a top wall of the tubular body to define therebetween a flow channel, and catching and skimming off the bubble containing flow rising upwardly in the spaces between the longitudinal baffles by way of the lateral baffles and passing same directly by way of the spaces between the lateral baffles into said flow channel for movement therealong toward the gas accumulating chamber.

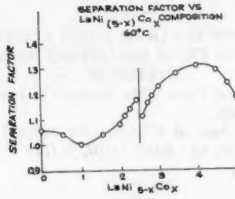
4,276,060

CHROMATOGRAPHIC HYDROGEN ISOTOPE SEPARATION

Frederick T. Aldridge, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 22, 1979, Ser. No. 41,364
Int. Cl.³ B01D *15/08*
U.S. Cl. 55—67 **25 Claims**

1. A method of chromatographically separating hydrogen isotopes in a separation column comprising passing isotopically mixed hydrogen gas through a separation medium comprising



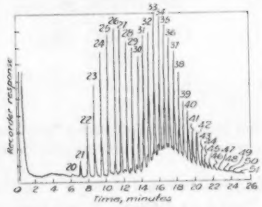
a hydride forming intermetallic alloy selected from the group of intermetallic alloys with a $CaCu_5$ type of crystal structure.

4,276,061

CHROMATOGRAPHIC COLUMN PACKING HAVING A BONDED ORGANOSILOXANE COATING

Terry J. Nestrick, and Rudolph H. Stehl, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 62,380, Jul. 31, 1979. This application May 14, 1980, Ser. No. 149,868
Int. Cl.³ B01D *15/08*
U.S. Cl. 55—67 **20 Claims**



1. A process for making a chromatographic separation of components contained in a sample which comprises:

(a) mixing the vaporized sample with an inert carrier gas, and

(b) contacting the sample-carrier gas mixture with a chromatographic column packing permeable by said mixture and consisting essentially of a silica support having a chemically bonded surface coating, said packing being the product of the process comprising the combination of steps:

(1) reacting by contacting an acid-activated siliceous surface with $SiCl_4$, thereby causing substantial chlorosilylation of said surface,

(2) reacting by contacting the chlorosilylated surface with water vapor until essentially all of the chlorosilyl groups have been hydrolyzed to hydroxysilyl groups,

(3) reacting by contacting the hydrolyzed surface with excess dichlorosilane of the formula $RR'SiCl_2$ wherein R and R' each represent a methyl, ethyl, or vinyl radical for a time sufficient to react at least the major proportion of the hydroxysilyl groups to form corresponding disubstituted chlorosilyl groups,

(4) reacting by contacting the reacted product of (3) with water vapor until essentially all of the disubstituted chlorosilyl groups have been hydrolyzed to corresponding disubstituted hydroxysilyl groups,

(5) reacting by contacting the hydrolyzed product of (4) with $SiCl_4$ for a time sufficient to react substantially all of said disubstituted hydroxysilyl groups to form silyloxy chlorosilyl groups,

(6) reacting by contacting the chlorosilylated product of (5) with a molar excess over said silyloxy chlorosilyl

groups of a siloxane polymer polyol in the liquid state, said polyol having a molecular weight of at least about 230 and having a molecular structure consisting essentially of repeating units of the formula

thereby reacting essentially all of said silyloxy chlorosilyl groups with said polyol to form pendant polyol residues having at least one terminal hydroxyl group per residue,

(7) repeating the sequence of steps (1) through (6) from one to about four times, and (8) reacting the product of the final step (6) by contacting with a trimethylsilyl capping reagent, thereby etherifying essentially all of the terminal hydroxyl groups on the pendant polyol residues with trimethylsilyl groups.

4,276,062

FLUIDIZED BED SYSTEMS

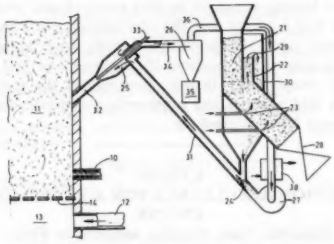
David Lyon, and Gerald Moss, both of Oxford, England, assignors to The United States of America as represented by the Administrator of the U.S. Environmental Protection Agency, Washington, D.C.

Filed May 19, 1977, Ser. No. 798,544

Claims priority, application United Kingdom, May 21, 1976, 21162/76

Int. Cl.³ B01D *53/12*

U.S. Cl. 55—77 **13 Claims**



1. A method of supplying a process zone with particles of sizes, weights and densities in a selected range according to their fluidization characteristics comprising introducing a mixture of particulate solid materials of different particle sizes and densities into a bed in a vessel; fluidizing said mixture by an upwardly passing fluidizing fluid in said vessel, said vessel having an overflow weir or orifice above its bottom which weir or orifice limits the maximum level of the top of the bed, under such fluidizing conditions of superficial velocity of the fluidizing fluid that particles having a fluidization velocity in said fluid greater than a selected superficial velocity sink downwardly in the vessel and particles having a lower fluidization velocity are caused to pass out of the vessel by flow over said weir or through said orifice; recovering the particles which have passed out of the vessel; entraining the recovered particles in a conveying fluid and circulating the conveying fluid and entrained particles to separating means wherein particles having a size not substantially less than a selected size are separated from the conveying fluid; and entraining said thus separated particles in an injecting fluid which injects entrained particles into said process zone.

7. Apparatus for supplying process zone equipment with particles of sizes, weights and densities in a selected range, as determined by their fluidization characteristics, said apparatus comprising a vessel for containing a bed comprising a mixture of particulate solid materials of different particle sizes and densities, said vessel having an outlet above the level of its bottom, said outlet serving to limit the maximum level of the top of said bed, means for passing a fluidizing gas into the vessel for fluidizing particles in the vessel at a selected fluidization velocity, a chamber for receiving particles which pass out of the outlet, the chamber communicating with a dilute phase conveying conduit, means operative for passing a conveying fluid into one end of the conveying conduit for entraining particles from the chamber, separating means at the other end of the conveying conduit adapted for separating from conveying fluid, entrained particles having a combination of size and density not substantially less than a selected size and density combination, an injection conduit having the separating means at one end and means operative for passing an injecting fluid into said injection conduit for entraining particles separated in said separating means and transporting the entrained particles to the end of the injection conduit at the location of part of the process zone equipment.

4,276,063

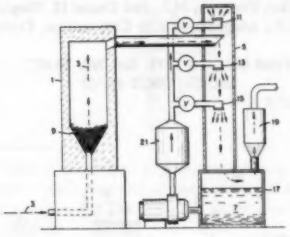
GAS SCRUBBING LIQUIDS

Walter J. Lackey; Robert S. Lowrie, both of Oak Ridge, and John D. Sease, Knoxville, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 577,819, May 15, 1975, abandoned. This application Jan. 21, 1977, Ser. No. 761,037

Int. Cl.³ B01D *47/06*

U.S. Cl. 55—84 **8 Claims**



1. In a method of removing contaminants from a gas stream emanating from a fluidized bed particle coating furnace in which nuclear fuel particles are coated with carbon or silicon carbide by the thermal decomposition of a hydrocarbon or a chlorinated silane, said furnace containing fissionable material capable of nuclear criticality in the presence of hydrogenous moderating material, the improvement comprising scrubbing said gas stream with a liquid scrubber consisting essentially of a member selected from the group consisting of perchloroalkenes.

4,276,064

FIRE CONTROL SYSTEM FOR SPRAY BOOTH

Donald F. Gerdes, Park Ridge, Ill., assignor to Binks Manufacturing Company, Franklin Park, Ill.

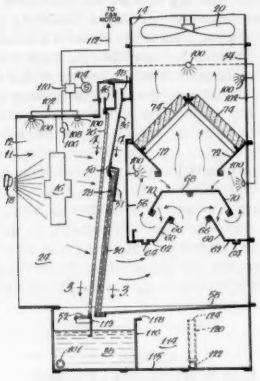
Continuation of Ser. No. 591,162, Jun. 27, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 740,120

Int. Cl.³ B01D *47/00*

U.S. Cl. 55—217 **4 Claims**

4. In an arrangement for removing water flowing into a reservoir containing oil and displacing the oil upwardly, the reservoir being located beneath a paint spray booth and containing oil to a level below the level of the top of said reservoir: a standpipe in said reservoir, said standpipe having an inlet in communication with a lower portion of said reservoir and having an outlet to the exterior of said reservoir, the outlet of said standpipe being located at a level about the initial level of

the oil in said reservoir and below the level of the top of said reservoir so that water only will be discharged from said reser-



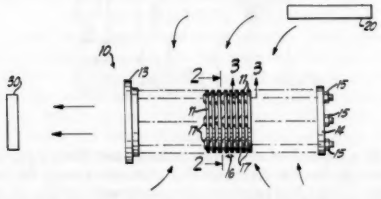
voir after the oil therein has been sufficiently displaced by the water flowing into said reservoir such that the level of water is above said inlet, said oil being retained in said reservoir.

4,276,065

REUSABLE DISC FILTER WITH SPACING BOSSES FOR HIGH TEMPERATURE GASSES

Richard J. Miko, Paramus, N.J., and Daniel H. Shapiro, Roslyn Heights, N.Y., assignors to Edo Corporation, College Point, N.Y.

Filed Mar. 14, 1979, Ser. No. 20,487
Int. Cl.³ B01D *46/40*
U.S. Cl. 55—278 **6 Claims**



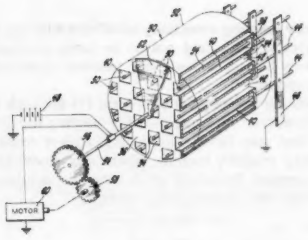
1. A hot gas filter to remove contaminants from a gas stream generated by a burning propellant and having a gas temperature in excess of 4500° F., the filter to be capable of surviving numerous exposures to the hot gas without damage and to be used in a system between the burning propellant and a movable member downstream of the filter to reliably prevent fouling of the downstream member after numerous exposures to the hot gas, said filter comprising: a plurality of axially aligned, generally flat discs; a cap at one end of the aligned discs; a flange with an opening at the other end of the aligned discs; a plurality of studs attached to the cap and flange to hold the filter together, the studs passing through holes in each disc to maintain the position of the discs in the filter; the stud holes in each generally flat disc having raised bosses surrounding the stud holes on one side of the disc, said bosses being raised from the generally flat disc surface to establish a spacing between adjacent discs to define filter gaps between the edges of the discs; each disc having a plurality of flow openings in communication with the said filter gaps and aligned and in communication with the respective flow openings in the other discs; the flange opening overlapping at least a portion of each of the aligned flow openings in the discs; and the discs being comprised of a metal capable of withstanding the high temperature gas without melting.

4,276,066

MONOLITH DIESEL EXHAUST FILTER WITH SELF-REGENERATION

Kenneth B. Bly, Pontiac; Mark J. Gutwald, and Otto A. Ludecke, both of Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 25, 1980, Ser. No. 124,141
Int. Cl.³ B01D *39/20*; F01N *3/02*
U.S. Cl. 55—287 **5 Claims**



1. A self-regenerating monolithic exhaust particulate filter for diesel engines, said filter including

a monolithic filter element having a plurality of interconnecting internal porous walls defining a plurality of small inlet passages extending adjacent a plurality of small outlet passages, said inlet and outlet passages being in communication through said porous walls for passing exhaust gases through said walls to filter particulates from the gases and deposit said particulates on the wall surfaces within the inlet passages, and the improvement comprising

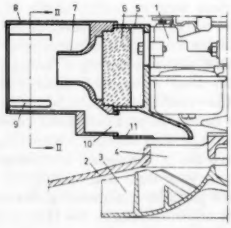
electric heating means in at least some of said passages to heat said passages and the surrounding portions of said element when energized and thereby raise the collected particulates in said portions of the element to their incineration temperature, thereby burning off the particulates from said portions and regenerating said portions of the element for continued use.

4,276,067

INDUCTION AIR CLEANER FOR A LAWN MOWER ENGINE

Karl A. Lindman, Oxie, Sweden, assignor to Flymo Societe Anonyme, Zug, Switzerland

Continuation of Ser. No. 628,601, Nov. 4, 1975, abandoned. This application Apr. 5, 1977, Ser. No. 784,815
Claims priority, application United Kingdom, Nov. 9, 1974, 48575/74
Int. Cl.³ B01D *50/00*
U.S. Cl. 55—337 **2 Claims**



1. The combination comprising, a lawn mower housing including thereunder a rotatable air impeller for producing an air cushion supporting the lawn mower housing during operation,

a combustion engine mounted to rotate said impeller,

a carburettor disposed on said engine having an opening for receiving air,

an air inlet port in said housing through which said impeller sucks air downwardly for said air cushion,

a filter housing connected to said carburettor to pass air into said opening,

a porous filter element in said filter housing through which air flows to said carburettor through said opening,

a further housing comprising a closed end cylindrical chamber having elongated tangential air inlet openings therein adjacent the closed end and an induction tube extending coaxially therein, structure on said further housing engaging the filter housing to direct air thereto through said induction tube,

means disposed to receive air flow outside the coaxial position of said induction tube defining an air flow path from said tangential openings in said further housing to said inlet port thereby causing said impeller to suck air into said tangential air inlet openings causing air flowing through said further housing to define a cyclone action with a central vortex about the cylindrical chamber axis,

and said induction tube defining a single air inlet path to said carburettor opening positioned coaxially within said further housing thereby receiving a smaller amount of the air introduced into said tangential openings only from the cleaner air at the central portions of said vortex, whereby air is received from the elongated tangential air inlet openings for passage of a smaller portion of the air having dirt removed therefrom by cyclone action to said induction tube with the remainder and at least a substantial portion of the dirt therewith passing to said air inlet port in the lawn mower housing.

4,276,068

SWIRL CHAMBER APPARATUS

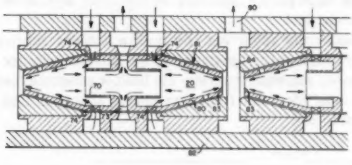
Friedrich Laussermair, Krailling, and Eberhard Willeitner, Utting a. Ammersee, both of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 27, 1978, Ser. No. 946,191

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1977, 2743391

Int. Cl.³ B01D *45/12*

U.S. Cl. 55—348 **20 Claims**



1. Swirl tube or chamber apparatus for separating isotope or gas mixture of a process gas having heavy and light gas fractions, comprising:

a swirl chamber,

first extraction element means for extracting a heavy gas fraction from the swirl chamber,

and second extraction element means for extracting a light gas from the swirl chamber,

wherein said swirl chamber is a rotatably supported hollow container, having the hollow portion defined by a wall, which is symmetrically configured with respect to a plane extending transverse to its rotational axis, said container being fitted with slot means adapted to be rotatably driven by the process gas, and

further including means for rotatably supporting said container comprising a member spaced from and surrounding at least part of said container, and passage means for passing process gas to the space between the member and the container, whereby a gas bearing is formed in the space between the member and the container,

said member having guiding means for directing process gas to impinge against said slot means, whereby the process gas rotatably drives the container, and

at least one feed port issuing tangentially into the swirl chamber for feeding process gas thereto, with gas feed means for feeding process gas to said at least one feed port.

4,276,069

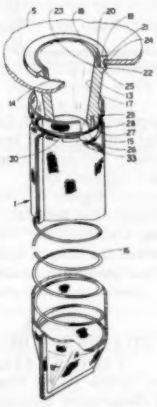
FILTER ARRANGEMENT

David L. Miller, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Sep. 12, 1979, Ser. No. 75,172

Int. Cl.³ B01D *46/02*

U.S. Cl. 55—379 **10 Claims**



1. A filter arrangement adapted to be secured to an apertured header plate disposed across a dirty gas stream between the dirty gas inlet and the clean gas outlet of a filter bag housing, comprising:

a tubular filter;

a filter bag support member integrally formed of a relatively rigid resilient material including a venturi-like tube section forming a venturi extending through the member;

said member having a flexible collar portion at one end of the tube section for releasably securing the member to the apertured plate and an annular shoulder portion formed at the other end of the tube section extending into one end of the filter; and

clamping means surrounding said one end of the filter and securing it to said shoulder portion in supporting sealing relation proximate the throat of the venturi extending through the member to provide a relatively unobstructed opening at said one end of the filter, thereby essentially minimizing pressure losses in the gas stream flowing through the filter.

4,276,070

REMOVABLE DUST COLLECTING CONTAINER FOR PROFESSIONAL AND HOUSEHOLD VACUUM CLEANERS

Niklaus Hug, Romanshorn, Switzerland, assignor to Rommag P. Wörwag & Co., Romanshorn, Switzerland

Filed Dec. 26, 1979, Ser. No. 106,481

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2856103

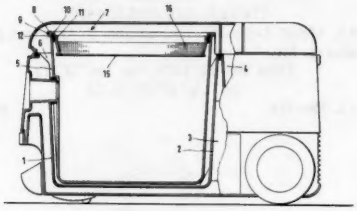
Int. Cl.³ B01D *46/04*

U.S. Cl. 55—429 **9 Claims**

1. A removable dust collecting container for professional,

industrial, and household vacuum cleaner, said container having an open top portion when set upright, and an inlet for dusty gas, said container comprising in combination:

a frame-like dust filter serving as a cover for closing off said open portion of said dust collecting container by being arranged in said container in a positive connection; said top portion of said dust collecting container being conically widened to receive said filter, said filter including a frame being provided with a narrow peripheral edge that



extends horizontally, and said dust collecting container being provided with an upper boundary surface that extends horizontally and upon which said narrow edge of said filter frame engages; and

a soft-elastic seal rectangular in cross section and sealingly arranged in engagement between the inner surface of said dust collecting container and the outer surface of said filter frame, when the latter is arranged in said container, for effecting said positive connection.

4,276,071

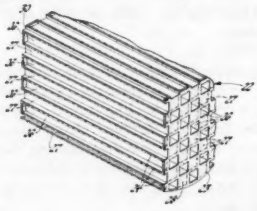
CERAMIC FILTERS FOR DIESEL EXHAUST PARTICULATES

Robert J. Outland, Grosse Pointe Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 3, 1979, Ser. No. 99,935

Int. Cl.³ B01D *39/20*

U.S. Cl. 55—523 **4 Claims**



1. A compact through flow exhaust particulate filter element for diesel engines, said element comprising a ceramic monolith having a plurality of interlaced thin gas filtering porous internal walls defining a plurality of parallel passages extending to opposite ends of the element, said passages including a first group comprising inlet passages open at one end of the element and closed at the other and a second group comprising outlet passages closed at said one end of the element and open at the other, wherein the said inlet and outlet passages are arranged such that each non-engaged portion of every interior wall in the element lies between an inlet passage and an outlet passage and forms a filtration surface for gas flow between them, the porosity of the walls being sized to filter out a substantial portion of particulates present in diesel exhaust gases passed through the element from the inlet to the outlet passages and the improvement wherein the inlet passages have individual and collective cross-sectional areas substantially greater than the respective individual and collective cross-sectional areas of the outlet passages to provide a significant volume for collection of particulates in the filter element inlet passages without reduction of their effective flow area below that of the outlet passages.

4,276,072

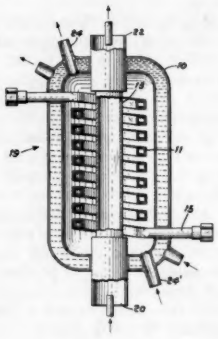
OPTICAL FIBER FABRICATION

Brian O'Brien, Jr., Fabyan, Conn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jun. 7, 1977, Ser. No. 804,208

Int. Cl.³ C03B *37/01*

U.S. Cl. 65—3 A **32 Claims**



1. A method for forming a high purity glass preform, comprising the steps of:

providing a removable hollow tubular deposition substrate of a radio frequency energy susceptible material;

enclosing said substrate as a susceptor inside a primary high-frequency induction coil having a plurality of turns;

varying the distance between said plurality of turns;

subjecting the substrate to radio frequency energy to heat said substrate;

passing high purity glass-forming materials in vapor form through the hollow substrate wherein the heat from the substrate causes a reaction resulting in the depositing of the high purity materials on the inner surface of the substrate; and

subsequently removing the hollow tubular substrate from the high purity material to provide a cylinder of high purity material, whereby the hollow substrate functions as a substrate, radio frequency energy susceptor and reaction enclosure.

4,276,073

METHOD OF FORMING GLASS BOTTLES

John D. Northup, Toledo, Ohio, assignor to Ruth B. Northup; John D. Northup, Jr.; Nancy Northup Lehrkind and Mary E. Northup, part interest to each

Filed Jan. 17, 1980, Ser. No. 112,846

Int. Cl.³ C03B *9/20*

U.S. Cl. 65—77 **12 Claims**

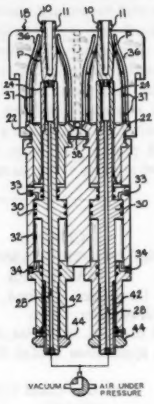
1. A method of forming a glass bottle which includes:

introducing into a blow mold a parison having a central bubble therein, which parison has a height less than 75% of the height of the blow mold cavity;

engaging a bottom of the parison with a gripping mechanism;

mechanically stretching the parison to a position close to, but not at, the lower surface of the mold cavity by moving the gripping mechanism;

releasing the gripping mechanism from contact with the parison to allow the parison bottom to reheat;



expanding the parison to the configuration of the blow mold; and

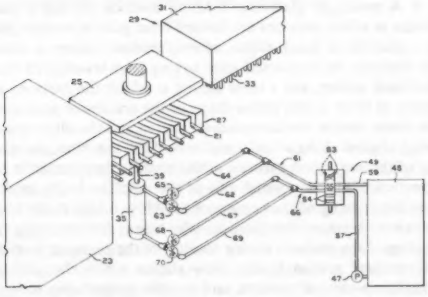
removing the blown bottle from the blow mold.

4,276,074

FLUID REPLACEMENT SYSTEM FOR HYDRAULIC ACTUATORS FOR GLASS SHEET SHAPING MOLDS AND METHOD OF PRESS BENDING GLASS SHEETS

James S. Shuster, Leechburg, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 13, 1979, Ser. No. 75,386
Int. Cl.³ C03B *23/03*
U.S. Cl. 65—106 **7 Claims**



1. In a method of shaping a glass sheet wherein the method includes the steps of heating the sheet to its shaping temperature; positioning the heated sheet between a first pressing mold and a second pressing mold, the first pressing mold having a shaping surface of a predetermined configuration and the second pressing mold having a shaping surface complementary to the shaping surface of the first pressing mold; actuating a piston assembly to move the first pressing mold from a sheet engaging position toward and against the second pressing mold into a sheet pressing position with the sheet therebetween to shape the sheet, the piston assembly having a piston movably mounted within a piston cylinder to divide the cylinder into first and second chambers; and actuating the piston assembly to move the first pressing mold from the sheet pressing position into the sheet engaging position; and the first actuating step is accomplished by moving a hydraulic fluid under pressure into the first chamber to move the piston out of the chamber and moving the hydraulic fluid out of the second chamber while maintaining the fluid in the first chamber under pressure to shape the sheet wherein maintaining the hydraulic fluid under pressure causes heating of the hydraulic fluid which tends to carbonize the fluid which restricts the flow of the fluid and/or causes the fluid to foam which prevents maintaining the hydraulic fluid under constant pressure during pressing of the sheet, and the second actuating step is accomplished by moving hydraulic fluid into the second chamber and out of the first chamber, the improvement comprising the steps of:

moving hydraulic fluid into the second chamber of the piston assembly from lower portion of a reservoir while moving heated hydraulic fluid from the first chamber into top portion of the reservoir during the practice of the second actuating step;

cooling the hydraulic fluid received in the reservoir, said cooling step accomplished by providing a larger volume of fluid in the reservoir than that expected to be exhausted from the piston assembly and conducting heat from the reservoir; and

moving the hydraulic fluid from the second chamber into the top portion of the reservoir while moving cooler hydraulic fluid from the bottom portion of the reservoir into the first chamber during the practice of the first actuating step to prevent carbonizing and/or foaming of the fluid to maintain a constant pressure on the first pressing mold during shaping of the sheet.

5. In an apparatus for shaping a sheet wherein the apparatus is of the type having a first pressing mold having a shaping surface of a predetermined configuration; a second pressing mold having a shaping surface complementary to the shaping surface of the first pressing mold and means for moving the first pressing mold between a sheet engaging position and a sheet pressing position wherein the first pressing mold in the sheet pressing position continuously urges the sheet to be shaped between the first and second pressing molds, the moving means includes a piston assembly having a piston mounted in a cylinder to divide the cylinder into first and second chambers; first means for passing hydraulic fluid under pressure into the first chamber and for passing hydraulic fluid out of the second chamber to move the first pressing mold from the sheet engaging position toward and into the sheet pressing position and to maintain the hydraulic fluid under pressure during the pressing of the sheet wherein maintaining the hydraulic fluid under pressure causes heating of the hydraulic fluid which tends to carbonize and/or foam the hydraulic fluid; and second means for passing the hydraulic fluid into the second chamber and for passing the hydraulic fluid out of the first chamber to move the first pressing mold from the sheet pressing position to the sheet engaging position, the improvement comprising:

a reservoir container hydraulic fluid;

means for cooling the hydraulic fluid in said reservoir to maintain the hydraulic fluid in said reservoir below the temperature of incoming hydraulic fluid from the first chamber, said cooling means including a larger volume of fluid in said reservoir than that expected to be exhausted and means for conducting heat from said reservoir;

said first passing means including means for connecting the second chamber of the cylinder to upper portion of said reservoir and for connecting the first chamber of the cylinder to lower portion of said reservoir to move cooler hydraulic fluid into the first chamber to prevent carbonizing and/or foaming of the fluid to maintain a constant pressure on the first pressing mold when the first pressing mold is in the sheet pressing position; and

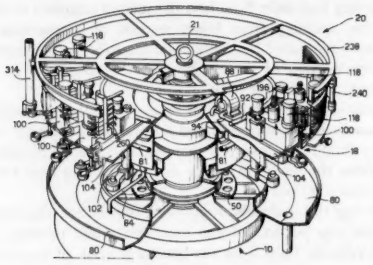
said second passing means includes means for connecting the first chamber of the cylinder to the upper portion of said reservoir to cool the incoming heated hydraulic fluid and the second chamber of cylinder to the lower portion of said reservoir.

4,276,075

MACHINE FOR THE MANUFACTURE OF GLASS ARTICLES BY BLOW MOULDING GLASS

Vanfrido Olivotto, Turin, Italy, assignor to Olivotto Vetromeccanica S.a.s., Turin, Italy

Filed Nov. 7, 1979, Ser. No. 92,003
Claims priority, application Italy, Nov. 30, 1978, 69747 A/78
Int. Cl.³ C03B 11/02
U.S. Cl. 65—160 21 Claims



12. A machine for the manufacture of glass articles by blow moulding, comprising:

a carousel mounted for rotation about a vertical axis,

drive means for continuously rotating said carousel,

a plurality of article-forming assemblies mounted on the carousel in a circumferentially-extending series and each comprising receiving means for receiving a gob of molten glass fed to the assembly, rough-blanking means including a plunger for moulding said molten-glass gob into a rough-blank, and blow-moulding means for blow-moulding the rough-blank into a required glass article, the said receiving, rough-blanking, and blow-moulding means for each assembly including a number of independently controllable operating means for moving and forming the molten glass, said blow-moulding means of each article-forming assembly including a said operating means arranged to form said molten glass by blowing air into said rough-blank during blow-moulding, and a blowing-air supply for supplying air to the blowing operating means,

a feed station fixed adjacent the carousel and arranged to deliver a said gob of molten glass to the receiving means of each article-forming assembly in turn as it is moved therepast by rotation of the carousel, and

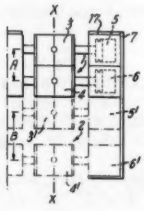
control means for controlling the said operating means of each said assembly to function in accordance with a predetermined work cycle in the forming of a said glass article, said control means comprising a set of primary control members arranged in an adjustable manner in predetermined fixed positions around said carousel adjacent thereto, and a respective set of secondary control members associated with each article-forming assembly for movement therewith during rotation of the carousel, the secondary control members of each set being arranged to control respective ones of said operating means of the associated assembly and being mounted on or adjacent that assembly in such positions that as the carousel rotates, the secondary control members are moved past and are influenced by respective said primary control members to control said operating means to operate in a sequence and with a timing dependent on the arrangement of said primary control members, the secondary control members which control corresponding operating means of different said assemblies being arranged in corresponding positions relative to their respective assemblies whereby the assemblies consecutively execute identical work cycles, and each said set of secondary control members including a proportional air-flow control valve connected into said blowing-air supply and arranged to control the flow of air to said blowing operating means, said proportional valve being provided with a control element coupled to a follower which is movable radially relative to the axis of the carousel, and the primary control member arranged to influence the said secondary control members formed by the proportional valves comprising a plurality of strips arranged to engage said follower of each proportional valve and support means supporting said strips at their ends such that they lie in a circumferentially-extending series and in a manner enabling said ends to be finely adjusted in position towards and away from the axis of the carousel, said plurality of strips extending in an arc of predetermined angular extent around said carousel.

4,276,076

TRANSFER MEANS OF GLASSWARE FORMING MACHINES

Frank A. Fenton, Doncaster, England, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed May 11, 1979, Ser. No. 38,372
Claims priority, application United Kingdom, May 24, 1978, 21916/78
Int. Cl.³ C03B 9/44
U.S. Cl. 65—241 6 Claims



1. A multi-gob glassware forming machine having a blank station at which parisons are formed from gobs of molten glass in a plurality of blank molds, an intermediate station at which the parisons are supported after having been transferred from the blank station, and a blow station at which the parisons are blown in blow molds to the shape of the articles of glassware, the blank station, the intermediate station and the blow station being aligned along a horizontal axis of the machine, the spacing of the supported parisons at the intermediate station in the direction of the horizontal axis of the machine being smaller than the spacing of the centers of the blow molds at the blow station in the same direction, transfer means for increasing the spacing of the parisons during transfer of the parisons from the intermediate station to the blow station while the parisons remain in a vertical position, said transfer means being reciprocal in a straight line between the intermediate station and the blow molds.

4,276,077

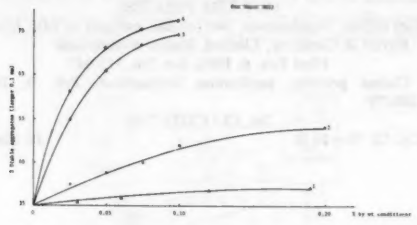
LIGNOSULFONATE-BASED GRAFT POLYMERS THEIR PREPARATION AND USES

Dan Zaslavsky, and Lev V. Rozenberg, both of Haifa, Israel, assignors to Technion Research and Development Foundation Ltd., Technion City, Israel

Continuation-in-part of Ser. No. 866,936, Jan. 4, 1978, abandoned. This application Dec. 31, 1979, Ser. No. 108,823
Claims priority, application Israel, Dec. 18, 1975, 48686; Nov. 2, 1977, 53288
Int. Cl.³ C05G 3/04, 3/02
U.S. Cl. 71—64 SC 21 Claims

1. A soil conditioner produced by the exothermic reaction of graft polymerization of crude lignosulfonate with a monomer

selected from the group consisting of vinyl cyanide, vinyl acetate, hydrolized vinyl acetate and acrylamide or combinations thereof at a pH range of between 2 and 6 in the presence of an initiator.



4,276,078
HERBICIDE COMPOSITIONS

Ferenc M. Pallos, Walnut Creek; Mervin E. Brokke, Moraga, and Duane R. Arneklev, Sunnyvale, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

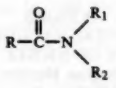
Division of Ser. No. 930,967, Aug. 4, 1978, which is a division of Ser. No. 208,041, Dec. 9, 1971, Pat. No. 4,137,070, which is a continuation-in-part of Ser. No. 134,868, Apr. 6, 1971, abandoned. This application Jun. 18, 1979, Ser. No. 49,767

The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.

Int. Cl.³ A01N *43/46, 37/02, 37/18*

U.S. Cl. 71—88 **16 Claims**

1. A herbicide composition comprising an active thiocarbamate herbicide compound and an antidotally effective amount of an antidote compound having the formula



wherein R is selected from the group consisting of $-CH(CH_3)Br$, $-C(CH_3)_2Br$, $-CCl_2-CH_3$, $-CF_2C_2F_5$, $-CH_2Cl$, $-CCl_3$, $-CBr_3$, $-(CH_2)_4$ $-CH_2Br$, $-CH_2-CH_2Cl$ and $-CH_2I$; and R_1 and R_2 are alkenyl containing from 2 to about 12 carbon atoms, inclusive; said antidote compound being antidotally active with said thiolcarbamate herbicide and wherein said antidote compound is present in an amount varying between about 0.0001 to 30 parts by weight for each part by weight of active herbicidal compound.

4,276,079
SYNERGISTIC HERBICIDAL COMPOSITION COMPRISING N-(BUTOXYMETHYL)-6'-TERT-BUTYL-2-CHLORO-O-ACETOTOLUIDIDE AND TRIALLATE

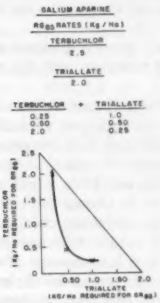
Bernard Convent, Leernes, Belgium, assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 18, 1975, Ser. No. 605,568

Int. Cl.² A01N *9/12, 9/20*

U.S. Cl. 71—100 **1 Claim**

1. A herbicidal composition consisting essentially of a herbicidally effective amount of a mixture of (a) N-(butoxymethyl)-6'-tert-butyl-2-chloro-o-acetotoluidide and (b) S-(2,3,3-trichloroallyl) N,N-diisopropylthiocarbamate wherein the ratio of (a) to (b) is within the range of from about 1:4 to 4:1.



4,276,080
PHENOXY-PHENOXYALKANE CARBOXYLIC ACIDS AND DERIVATIVES AS SUGAR ENHANCERS FOR PLANTS

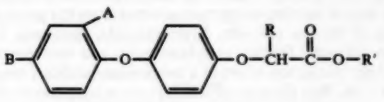
John F. Koerwer, Perkasie, Pa., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 25, 1980, Ser. No. 133,847

Int. Cl.³ A01N *37/38*

U.S. Cl. 71—108 **36 Claims**

1. A method for increasing the sugar content of plants which comprises applying to such plants from 1 to 7 weeks prior to harvesting an effective amount of a compound of the formula



wherein:

A is a hydrogen atom or a halogen atom,

B is a hydrogen atom or a halogen atom,

R is a hydrogen atom or a methyl group, and

R' is a hydrogen atom, an alkyl group having from 1 to 4 carbon atoms, or a cation;

provided, however, that either A or B must be a halogen atom.

4,276,081
PROCESS FOR BENEFICIATING ORES

James K. Kindig, Arvada, and Ronald L. Turner, Golden, both of Colo., assignors to Hazen Research, Inc., Golden, Colo.

Continuation-in-part of Ser. No. 950,177, Oct. 10, 1978, abandoned. This application Dec. 10, 1979, Ser. No. 101,583

The portion of the term of this patent subsequent to Jun. 3, 1997, has been disclaimed.

Int. Cl.³ C22B *1/02*

U.S. Cl. 75—7 **76 Claims**

1. In a process for beneficiating sulfide ores and metal oxide ores from gangue, excluding coal, wherein the metal oxide ore is selected from the group consisting of bauxite, apatite, and the metal oxides of Groups IIB, IVB, VB, VIB, VIIB, VIIIB, IB, IIB and IVA, which contain elemental sulfur, wherein the ore is treated with a metal containing compound under conditions which cause the metal containing compound to react substantially at the surface of the metal sulfide or oxide particles to the substantial exclusion of the gangue particles so as to alter the surface characteristics of the metal values thereby

causing a selective enhancement of the magnetic susceptibility of one or more metal sulfide or oxide values of the ore to the exclusion of the gangue in order to permit a physical separation between the values and the gangue, the improvement comprising:

removing at least a portion of the elemental sulfur from the ore prior to its treatment with the metal containing compound.

10. In a process for the beneficiation of a metal sulfide ore or a metal oxide ore from gangue, excluding coal, wherein the metal oxide ore is selected from the group consisting of bauxite, apatite, and the metal oxides of Groups IVB, VB, VIB, VIIB, VIIIB, IB, IIB and IVA, which contain elemental sulfur, wherein the ore is treated with from 0.1 to about 100 kilograms of a metal containing compound per metric ton of ore at a temperature within the range of 125° C. less than the general decomposition temperature of the metal containing compound in a specific system for the ore being treated for a period of time of from about 0.05 to about 4 hours to cause the metal containing compound to react substantially at the surface of the metal sulfide or oxide particles to the substantial exclusion of the gangue particles so as to alter the surface characteristics of the metal values thereby causing a selective enhancement of the magnetic susceptibility of one or more metal sulfide or oxide values contained in the ore to the exclusion of the gangue so as to permit a separation between the values and the gangue, the improvement comprising:

removing at least a portion of the elemental sulfur from the ore prior to its treatment with the metal containing compound.

28. In a process for the beneficiation of a metal sulfide ore selected from the group consisting of galena, molybdenite, sphalerite, bornite, cinnabar, arsenopyrite, smaltite, chalcocite, chalcopyrite, orpiment, pentlandite, stibnite and tetrahedrite or a metal oxide ore selected from the group consisting of bauxite, apatite and the metal oxides of Groups IIIB, IVB, VB, VIB, VIIB, VIIIB, IB, IIB and IVA, which contain elemental sulfur, by treating the ore with from about 1 to about 50 kilograms of an iron containing compound selected from the group consisting of ferrous chloride, ferric chloride, ferrocene, ferric acetylacetonate, ferrous acetylacetonate, and iron pentacarbonyl per metric ton of ore at a temperature within a range of 125° C. less than the general decomposition temperature of the iron containing compound in a specific system for the ore being treated for a period of time from about 0.15 to about 2 hours to cause the iron containing compound to react substantially at the surface of the metal sulfide or oxide particles to the substantial exclusion of the gangue particles so as to alter the surface characteristics of the metal values thereby causing a selective enhancement of the magnetic susceptibility of one or more metal sulfide or oxide values of the ore to the exclusion of the gangue in order to permit a magnetic separation between the values in gangue, the improvement comprising:

removing at least a portion of the elemental sulfur from the ore prior to its treatment with the iron containing compound.

50. In a process for the beneficiation of sulfide ores and metal oxide ores from gangue, excluding coal, wherein the metal oxide ore is selected from the group consisting of bauxite, apatite, and the metal oxides of Groups IIIB, IVB, VB, VIB, VIIB, VIIIB, IB, IIB, and IVA, which contain elemental sulfur, wherein the ore is treated with an iron carbonyl under conditions which cause the iron carbonyl to react substantially at the surface of the metal sulfide or oxide particles to the substantial exclusion of the gangue particles so as to alter the surface characteristics of the metal values thereby causing a selective enhancement of the magnetic susceptibility of one or more metal sulfide or oxide values of the ore to the exclusion of the gangue in order to permit a physical separation between the values and the gangue, the improvement comprising:

removing at least a portion of the elemental sulfur from the ore prior to its treatment with the iron carbonyl.

4,276,082

PROCESS FOR THE HEATING AND/OR MELTING OF METALS AND AN INDUCTION FURNACE TO CARRY OUT THE PROCESS

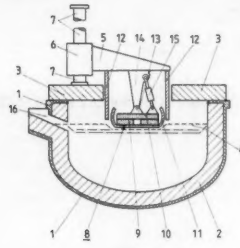
Karl Bühler, Nussbaumen, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Feb. 6, 1980, Ser. No. 119,047

Claims priority, application Switzerland, Feb. 9, 1979, 1280/79

Int. Cl.[3] **C22D** *7/00*

U.S. Cl. 75—10 R **14 Claims**



1. A process for the heating and/or melting in an induction furnace which contains a melting charge having a surface and which contains a boiler in which there is at least one inductor having only electrically nonconductive material positioned between said conductor and said melting charge, comprising the steps of:

directly heating the melting charge from above by the inductor through which an alternating current flows, said heating resulting from the direct interaction of said alternating current and said melting charge; and lowering the inductor below said surface but only to a depth in which the rejecting power of the electro-magnetic field of the inductor caused by electric current flowing through it holds the melting charge away from the inductor.

4,276,083

RECOVERY OF METAL VALUES FROM A METAL BEARING SOURCE OF NICKEL AND VANADIUM

William K. Tolley, Arlington Heights; William C. Laughlin, Hoffman Estates, and William Rostoker, Chicago, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Nov. 1, 1979, Ser. No. 90,217

Int. Cl.[3] **C22B** *23/02;* **B22F** *9/00*

U.S. Cl. 75—82 **13 Claims**

1. A process for the recovery of metal values from a metal bearing source containing nickel and vanadium, the nickel being in the form of a sulfide, which comprises treating said source with a mild oxidant selected from the group consisting of carbon dioxide, water, sulfur dioxide, and mixtures thereof at conditions to convert the nickel sulfide to metal and the vanadium to an oxide, and separating the resultant metallic nickel from the vanadium oxide.

4,276,084

HYDROMETALLURGICAL PROCESS FOR THE RECOVERY OF LEAD

James E. Reynolds, Golden, and Alan R. Williams, Denver, both of Colo., assignors to Hazen Research, Inc., Golden, Colo.

Filed Oct. 1, 1979, Ser. No. 80,444

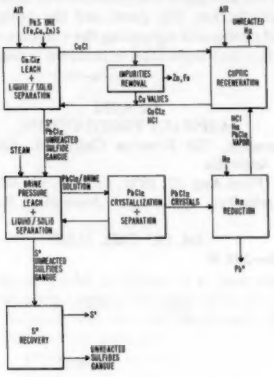
Int. Cl.[3] **C22B** *13/04*

U.S. Cl. 75—101 R **21 Claims**

1. A process for obtaining lead chloride from sulfide ores containing lead sulfide comprising:

(a) leaching the ore with an aqueous solution containing cupric chloride under reaction conditions of temperature, time, pH, an oxidizing emf, total copper concentration and

total chloride ion concentration selected so as to convert a substantial portion of the lead sulfide to lead chloride while leaving the remainder of the ore substantially unreacted and wherein the cupric chloride leach solution does



not solubilize all of the lead chloride so that a portion of the lead chloride precipitates from the leach solution; and

(b) separating solids comprising lead chloride, unreacted ore, sulfur and gangue from the leach solution.

4,276,085

HIGH SPEED STEEL

Henry L. Wisell, Söderfors, Sweden, assignor to Uddeholms Aktiebolag, Hagfors, Sweden

Continuation of Ser. No. 951,399, Oct. 16, 1978, which is a continuation of Ser. No. 851,765, Nov. 15, 1977, abandoned. This application Jan. 14, 1980, Ser. No. 111,963

Claims priority, application Sweden, Nov. 22, 1976, 7610346

Int. Cl.³ C22C *39/14*

U.S. Cl. 75—126 C **5 Claims**

1. Tool steel having a very high wear resistance for cutting purposes characterized in that it consists essentially of:

C 0.8–1.2 wt%

Cr 3.0–6.0 wt%

W up to 40 wt%

Mo up to 20 wt% where W+2Mo=20.0–40 wt%

Co up to 15 wt%

V not more than about 0.1 wt%

Balance Fe and normal impurities.

4,276,086

GOLD ALLOY WITH COPPER, SILVER AND ZINC

Masami Murao, Tokyo, Japan, assignor to Kabushiki Kaisha Murao Shoten, Tokyo, Japan

Filed Jan. 7, 1980, Ser. No. 109,875

Claims priority, application Japan, Jan. 18, 1979, 54-4567; Mar. 19, 1979, 54-31055

Int. Cl.³ C22C *30/00*

U.S. Cl. 75—134 C **6 Claims**

1. A gold alloy consisting of:

30.0 to 50.0% by weight of gold and

70.0 to 50.0% by weight of an alloying composition consisting of:

75.2 to 77.1% by weight of copper,

13.6 to 16.2% by weight of silver and

6.7 to 11.2% by weight of zinc.

4,276,087

POWDER-METALLURGY VANADIUM-CONTAINING TUNGSTEN-TYPE HIGH-SPEED STEEL

Walter T. Haswell, Jamesville, N.Y.; William Stasko, Munhall, and F. Robert Dax, Pittsburgh, both of Pa., assignors to Crucible Inc., Pittsburgh, Pa.

Filed May 3, 1979, Ser. No. 35,652

Int. Cl.³ C22C *1/04*

U.S. Cl. 75—243 **6 Claims**

1. A powder-metallurgy produced, cobalt-free vanadium-containing, tungsten-type high-speed steel consisting essentially of, in weight percent, carbon minimum 0.60%+0.20×percent vanadium+0.13×percent columbium and maximum 1.2%+0.20×percent vanadium+0.13×percent columbium, manganese 1.25 max., silicon 1.25 max., chromium 3 to 5, vanadium+columbium 0.8 to 6 with columbium not exceeding 4%, and balance iron, said steel being further characterized by a tungsten equivalent of 22 to 29% and an attainable hardness of at least 67 R_c when austenitized and triple tempered at 1025° F.

4,276,088

COMPOSITION FOR DIFFUSION COATING OF FERROUS METALS

Inna I. Zaets, ulitsa Vorobieva, 11, kv. 8; Nikolai M. Davydenko, ulitsa Komandarma Uborevicha, 14, kv. 45, both of Kharkov; Olga K. Yakshina, ulitsa 16 Parkovaya, 55, korpus 2, kv. 130; Nina F. Pershina, Kutuzovsky prospekt, 2/1, kv. 111, both of Moscow; Valentina D. Demyanenko, ulitsa Tonkopia, 19/3, kv. 85, Kharkov, and Jury M. Pavlov, ulitsa Pervomaiskaya, 73, kv. 94, Moscow, all of U.S.S.R.

Filed Jun. 24, 1980, Ser. No. 162,651

Int. Cl.³ C09D *5/10*; C23C *9/02*

U.S. Cl. 106—1.12 **2 Claims**

1. A composition for a diffusion coating of ferrous metals containing a particulate mixture of titanium in an amount of 70.0 to 82.0% wt alumina in an amount of 14.5 to 20.0% wt ammonium halide in an amount of 2.0 to 5.0% wt and graphite in an amount of 1.0 to 2.0% wt.

4,276,089

ANTICORROSION COMPOSITION

Francis Moran, Paris, France, assignor to Union Chimique et Industrielle de l'Ouest S.A., Paris, France

Filed Oct. 10, 1979, Ser. No. 83,553

Claims priority, application France, Oct. 13, 1978, 78 29312; Jun. 28, 1979, 79 16763

Int. Cl.³ C02F *5/12*

U.S. Cl. 106—14.12 **8 Claims**

1. An anti-corrosion composition for a metallic surface in contact with water comprising at least a polyamine and at least an alkylene-phosphonic acid derivative, which composition is water-insoluble and contains:

(A) at least a polyamine with a molecular weight at least 320 and having the general formula

$$R—[NM—(CH_2)_3]_{n1}—NH_2 \quad (I)$$

wherein R is a saturated or unsaturated aliphatic C_{12}–C_{22} hydrocarbon radical; and n_1 is an integer varying between 1 and 7 inclusive, R and n_1 being such that the molecular weight of the said polyamine is at least 320; and

(B) at least one alkylenephosphonic acid derivative selected from the group consisting of

(a) (i) the acids of formula

$$N\left(—Alk—P(=O)(OH)—OH\right)_3 \quad (II)$$

wherein alk is an alkylene group containing C_1–C_6 and a straight or branched hydrocarbon chain, and (ii) their C_1–C_4 alkyl esters;

(b) (i) the acids of formula

$$(H_2O_3P—CH_2)_2N—(CH_2)_{n2}—N(CH_2—PO_3H_2)_2 \quad (III)$$

wherein n_2 is an integer varying between 1 and 6 inclusive; and (ii) their C_1–C_4 alkyl esters;

(c) (i) -di(hydroxyethyl)aminomethylphosphonic acid of formula

$$(HO—CH_2CH_2)_2N—CH_2—PO_3H_2 \quad (IV)$$

(ii) its C_1–C_4 alkyl esters; and

(d) (i) acids of formula

$$Z^1—O—(Z^2—O)_{n3}—Z^3—N[(CH_2)_{n4}—PO_3H_2]_2 \quad (V)$$

wherein Z^1 is H or an C_1–C_4 alkyl group; Z^2 is a C_2–C_5 alkylene group; Z^3 is a C_2–C_5 alkylene group; n_3 is an integer varying between 1 and 20 inclusive, and n_4 *is an integer varying between* 1 and 4, and (ii) their C_1–C_4 alkyl esters.

4,276,090

METHOD FOR PROTECTING INDUSTRIAL SUBSTRATES FROM FUNGAL OR BACTERIAL ATTACK

Frank C. Becker, Gurnee, and Jorge P. Li, Libertyville, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 843,610, Oct. 19, 1977, Pat. No. 4,141,905. This application Nov. 13, 1978, Ser. No. 959,549

Int. Cl.³ C09D *5/14*

U.S. Cl. 106—18.32 **2 Claims**

1. The method of protecting a cellulosic, plastic or film-forming polymeric composition, knitted, woven, molded or extruded into a continuous form, against bacterial or fungal attack upon exposure to an environment containing common bacteria and fungi, comprising incorporating into said continuous form or coating said composition with a biocidally effective amount of N-(2-methyl-1-naphthyl)maleimide.

4,276,091

REFRACTORY GUN MIX

Nicholas Cassens, Jr., Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Mar. 27, 1980, Ser. No. 134,359

Int. Cl.³ C04B *35/04*

U.S. Cl. 106—58 **6 Claims**

1. A refractory composition suitable for gunning consisting essentially of from 0.5 to 5% bentonite, from 1.5 to 10% of a bonding system, and up to 10% pitch, the balance being sized refractory aggregate, characterized in that the bonding system is from 1 to 5% alkali metal phosphate and from 0.5 to 5% aluminum sulfate, all percentages being by weight and based on the total weight of the composition.

4,276,092

MANUFACTURE OF CEMENT

Charles F. St. John, Beaconsfield, and Gil A. Mercier, Pointe Claire, both of Canada, assignors to Lafarge Consultants Ltd., Montreal, Canada

Filed Dec. 3, 1979, Ser. No. 99,310

Int. Cl.³ C04B *7/09;* **I27B** *7/00*

U.S. Cl. 106—100 **23 Claims**

1. A method of removing volatile compounds containing at least one of alkali, chlorine and sulphur from the interior of an elongated rotary cement kiln in which cement raw feed is burnt to produce cement clinker; wherein the raw feed is initially preheated by kiln exit gases and is fed into the inlet end of the rotary kiln to produce in said inlet end a zone of suspended raw kiln feed, the kiln interior being filled with hot kiln gases and suspended volatiles-rich dust, which in operation move along the kiln toward the inlet end, the improvement comprising providing an elongated hollow probe in the kiln inlet end; the probe having an inlet head disposed at an axial position along the kiln such as to be beyond the most concentrated part of the zone of suspended raw kiln feed and within the moving hot kiln gases and volatiles-rich dust; withdrawing a portion of the hot kiln gases and the volatiles-rich dust through said probe; and separating the volatiles-rich dust from the kiln gases which have been withdrawn through said probe.

4,276,093

ASPHALT PRODUCTION

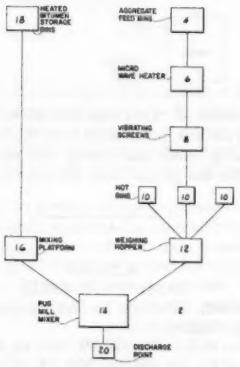
Otto Pickermann, 723 Ferntree Gully Rd., Glen Waverley, Victoria, Australia

Filed Aug. 31, 1978, Ser. No. 938,482

Claims priority, application Australia, Sep. 2, 1977, PD1482/77

Int. Cl.³ C08L *95/00*

U.S. Cl. 106—281 R **9 Claims**



1. A process for forming asphalt comprising mixing aggregate and bitumen, the aggregate and bitumen being heated separately prior to the mixing and/or being heated during mixing; at least the aggregate being heated by use of a microwave heater.

4,276,094

CLEANING OIL-CONTAMINATED VESSELS WITH α-EMULSANS

David L. Gutnick, Ramat Aviv, and Eugene Rosenberg, Raanana, both of Israel, assignors to Biotechnologie Aktiengesellschaft fur Emulsan, Basel, Switzerland

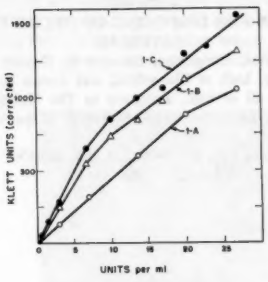
Continuation of Ser. No. 12,973, Feb. 22, 1979, abandoned. This application Dec. 21, 1979, Ser. No. 106,005

Int. Cl.³ B08B *9/00*

U.S. Cl. 134—10 **14 Claims**

1. A process for cleaning hydrocarbonaceous residues, including residual petroleum, from oil-contaminated tankers, barges, storage tanks, tank cars and trucks, pipelines and other containers used to transport or store crude oil or various petroleum fractions, which comprises (A) washing oil-contaminated surfaces of such containers with an emulsifying agent comprising an aqueous solution in sea water or fresh water containing (1) from about 10 mcg/ml to about 20 mg/ml of extracellular microbial protein-associated lipopolysaccharides (herein collectively called "α-emulsans") produced by Acinetobacter Sp. ATCC 31012 and its mutants, in which the lipopolysaccharide components (herein collectively called "apo-α-emulsans") are N- and O-lipoacylated heteropolysaccharides made up of major amounts of D-galactosamine and an aminouronic acid, such apo-α-emulsans containing at least 5 percent by weight of O-substituted fatty acid esters in which (i) the fatty acids con-

tain from about 10 to about 18 carbon atoms; and (ii) more than 50 percent by weight of such fatty acids are composed of 2-hydroxydodecanoic acid and 3-hydroxydodecanoic acid;



and (2) from about 5 mM or higher of at least one divalent cation thereby forming an oil-in-water emulsion of such hydrocarbonaceous residues; and (B) removing such oil-in-water emulsion from the washed container.

4,276,095

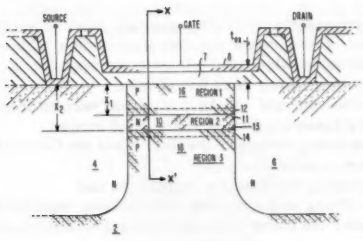
METHOD OF MAKING A MOSFET DEVICE WITH REDUCED SENSITIVITY OF THRESHOLD VOLTAGE TO SOURCE TO SUBSTRATE VOLTAGE VARIATIONS

Kenneth E. Beilstein, Jr., and Harish N. Kotecha, both of Manassas, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 829,393, Aug. 31, 1977, abandoned. This application Mar. 12, 1979, Ser. No. 19,797

Int. Cl.³ H01L *29/78, 21/26*

U.S. Cl. 148—1.5 **1 Claim**



1. A method for reducing the sensitivity of the threshold voltage to the substrate voltage in a field effect transistor having source and drain regions of N conductivity type with a channel therebetween, in a silicon substrate of P conductivity type, with a gate lying above the channel, wherein the improvement comprises the steps of:

forming said substrate with a background doping concentration of N_a conductivity enhancing dopant atoms per cubic centimeter, wherein N_a is approximately 7.5×10^{15} conductivity enhancing dopant atoms per cm^3;

selecting a sensitivity dV_t/dV_{sx} of the threshold voltage to the substrate voltage;

selecting a substrate-to-source voltage bias V_{sx};

determining the location and dopant concentration D of a phosphorous ion-implanted layer of said N conductivity type in said channel region having an upper PN junction at a distance X_1 beneath the surface of said substrate and a lower PN junction at a distance X_2 beneath said surface, so that the respective depletion regions of said two PN junctions merge at said selected value of V_{sx} to impart said selected sensitivity to the resultant transistor, wherein the relationship of X_1, X_2, D, N_a and dV_t/dV_{sx} is expressed by

$$\frac{dV_T}{dV_{sx}} = \frac{\epsilon_0\epsilon_s}{C_{ox}\sqrt{\frac{2\epsilon_0\epsilon_s}{qN_a}(V_{sx}+2\phi)+(X_1+X_2)\frac{D}{N_a}}};$$

ion-implanting said phosphorous ion-implanted layer at an ion implant energy of between 200 keV and 1000 keV at a dosage of between 6×10^{11} atoms per cm^2 and 7×10^{11} atoms per cm^2 to reduce said sensitivity of the threshold voltage to the substrate voltage by increasing the distance between mirrored charges in the substrate and in the gate through said merger of the depletion regions of said two PN junctions.

4,276,096

METHOD FOR PRODUCING HARD METAL BODIES OF INCREASED WEAR RESISTANCE

Johannes Kolaska, Bottrop, and Hans Grewe, Grefrath, both of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 887,812, Mar. 17, 1978, abandoned. This application Jan. 22, 1980, Ser. No. 114,313

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1977, 2717842

Int. Cl.³ C21D *1/48*

U.S. Cl. 148—16.6 **5 Claims**

1. Method for producing a hard metal body having increased wear resistance, the hard metal body containing at least one of the binder metals iron, cobalt and nickel and at least one of the carbides of the elements titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum and tungsten, and being produced by way of sintering and having a nitrogen containing surface, comprising: directly after a final sintering at a temperature between 1400° C. and 1500° C. of a hard metal body containing the binder metal and carbide, subjecting the body to a cooling cycle to cool the body to a temperature of 800° C. to 1450° C., and at any time after the body has been cooled by at least 50° C. from its final sintering temperature of 1400° C. to 1500° C. and during said cooling cycle, subjecting the body to a pressure between 50 bar and 5000 bar in a sintering autoclave at a temperature between 800° and 1450° C. and in an atmosphere comprising nitrogen, to enrich the hard metal body with nitrogen and to nitride the surface.

4,276,097

METHOD OF TREATING SM_2CO_{17}-BASED PERMANENT MAGNET ALLOYS

Robert L. Bergner, San Jose, Calif.; Frederick Rothwarf, Toms River, and Arthur Tauber, Elberon, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 2, 1980, Ser. No. 145,934

Int. Cl.³ H01F *1/02*

U.S. Cl. 148—101 **7 Claims**

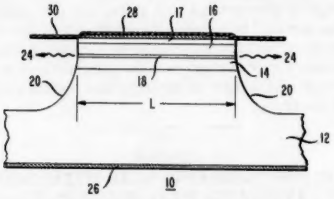
1. Method of lowering the reversible temperature coefficient of magnetization of a permanent magnet alloy, said method consisting of heat treating the alloy in an atmosphere selected from the group consisting of noble gas and vacuum by the steps of

(a) heating the alloy at about 1150 degrees C. for 1.5 hours, (b) quenching the alloy in ice water, (c) heating the alloy at about 940 degrees C. for 2 hours, (d) lowering the temperature to about 700 degrees C. and heating for one hour, (e) lowering the temperature to about 600 degrees C. and heating for one hour, (f) lowering the temperature to about 500 degrees C. and heating for 2 hours, and (g) lowering the temperature to about 400 degrees C. and heating for 10 hours.

4,276,098
BATCH PROCESSING OF SEMICONDUCTOR DEVICES

Ronald J. Nelson, Berkeley Heights, and Phillip D. Wright, New Providence, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 31, 1980, Ser. No. 135,643
Int. Cl.³ H01L *21/208*
U.S. Cl. 148—171 **13 Claims**



1. A method of fabricating mesa geometry devices from a semiconductor body comprising the steps of

forming a plurality of metal layers on separate localized portions of a major surface of said body,

forming an etch-resistant mask over each of said metal layers so that each of said metal layers is recessed within the periphery of its corresponding mask and other portions of said surface are exposed,

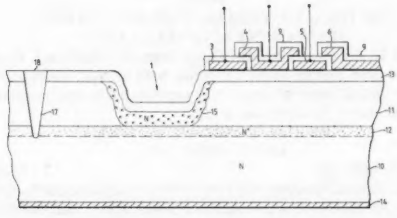
subjecting said body to an etchant effective to attack said other portions of said surface thereby forming said mesas under said masks, and

controlling the etching time so that said mesas do not undercut said metal layers.

4,276,099
FABRICATION OF INFRA-RED CHARGE COUPLED DEVICES

John M. Keen, Hanley Swan, and Arthur F. W. Willoughby, Eastleigh, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Oct. 10, 1979, Ser. No. 83,487
Claims priority, application United Kingdom, Oct. 11, 1978, 40117/78
Int. Cl.³ H01L *27/14, 31/00, 29/78*
U.S. Cl. 148—187 **13 Claims**

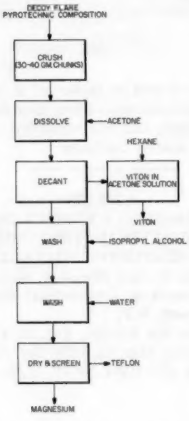


1. In a method of fabricating a semiconductor device, which device when fabricated includes a first region of a body of semiconductor material doped with a second species of a dopant which desirably should not penetrate during fabrication beyond said first region into a selected further region of the body, the improvement comprising introducing a first species of a dopant into said first region as a high-concentration layer so that the diffusion in said first region of ions of said first species generates an electric field which forms a barrier between said regions effective to repel ions of said second species from entering said selected further region, said first species being a relatively slower diffusing species than said second species.

4,276,100
PROCESS FOR DISPOSING OF DECOY FLARE MATERIAL

Robert E. Colvin, Loogootee; Bernard E. Douda; Francis E. Montgomery, both of Bloomfield, and James E. Short, Jr., Switz City, all of Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 13, 1976, Ser. No. 658,650
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—109.6 **6 Claims**



1. A process for reclaiming materials from decoy flares comprised of magnesium powder, fluorocarbon rubber and polytetrafluoroethylene, said process comprising,

first crushing decoy flares into chunks,

then dissolving said chunks in a solvent selected from the group consisting of acetone and ethyl acetate,

then decanting to remove the solvent and the fluorocarbon rubber in solution,

then washing the remaining ingredients, and

finally drying and screening the remaining ingredients to separate the magnesium and polytetrafluororethylene.

4,276,101
BREATHABLE LEATHER-LIKE MATERIALS AND PROCESS FOR MAKING SAME

Harold D. Lyons, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 686,622, May 14, 1976, abandoned, which is a division of Ser. No. 389,023, Aug. 16, 1973, abandoned. This application Nov. 30, 1979, Ser. No. 99,045
Int. Cl.³ B32B *31/06;* B05D *5/02*
U.S. Cl. 156—61 **11 Claims**

1. A process for producing a leather-like material having a high degree of air permeability, good abrasion resistance and resistance to cracking at low temperatures, which comprises the steps of:

(a) applying an aqueous polymer dispersion to a release medium, said dispersion having a gas entrapped therein to reduce the density of the dispersion to from about 0.4 to about 0.9 grams per cubic centimeter;

(b) bringing said polymer dispersion on said release medium into engagement with a porous, fibrous substrate having a plurality of fibers extending outwardly therefrom to re-

ceive and hold said polymer dispersion to form a release medium-polymer-substrate combination;

(c) subjecting said release medium-polymer-substrate combination to pressure to transfer said polymer dispersion to the fibers of said substrate whereby at least about 80 percent of said polymer is positioned along said outwardly extending fibers forming a polymer network wherein the tips of at least some of the fibers protrude from said polymer network with substantially no polymer being embedded in the base of said substrate, and wherein the polymer forms a discontinuous polymer phase which covers from about 30 percent to about 70 percent of the surface of said substrate with the remainder being a continuous pore phase; and

(d) drying said polymer-treated substrate to form a leather-like material having a surface luster of from about −0.7 to about +5.7.

4,276,102

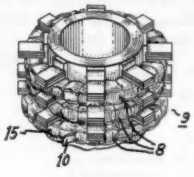
METHOD FOR COMPACTING TRANSPOSED CABLE STRANDS

Friedrich K. Schaeffer, Cheshire, Mass., and Thomas F. Brennan, Ft. Wayne, Ind., assignors to General Electric Company, N.Y.

Continuation-in-part of Ser. No. 72,377, Sep. 4, 1979, abandoned. This application Apr. 30, 1980, Ser. No. 145,278

Int. Cl.³ B29C *27/00*

U.S. Cl. 156—85 **7 Claims**



1. A method for compacting strands in transposed cables for use within transformers comprising the steps of:

providing a plurality of adhesive coated insulated wire strands in close proximity with each other in a transposed cable configuration;

wrapping a layer of heat shrinkable polymeric material around said cable in a gapped configuration to contain said strands in close proximity with each other and to allow for the egress of gaseous material and the impregnation of insulating oil through said gaps;

arranging said wrapped transposed cable around a winding cylinder to form a transformer winding;

evacuating said transformer winding;

heating said transformer winding to a first temperature to cause said adhesive to melt; and

heating said transformer winding to a second temperature to cause said polymeric material to shrink and to compact said strands.

4,276,103

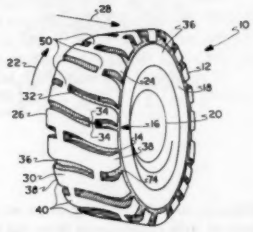
ADJUSTABLE TIRE TREAD AND METHOD OF APPLICATION OF A TREAD

Merritt W. Wolfe, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 9, 1980, Ser. No. 157,994

Int. Cl.³ B29H *17/36*

U.S. Cl. 156—96 **11 Claims**



1. An elongated tread adjustable in the longitudinal direction for application to a tire, the tread comprising an upper surface, a lower surface, a first and a second side extending longitudinally of the tread between said upper and lower surfaces, at least one tread element extending in a transverse direction of the tread, a pair of tread portions spaced from said tread element in generally the longitudinal direction of the tread, and an interconnecting means extending between and interconnecting said tread element with each of said tread portions to define a pair of spaces which overlap in a direction parallel to the upper surface and perpendicular to the longitudinal direction of the tread, one of said spaces extending through the tread between said tread element and one of said tread portions and severing said first side and said upper and lower surfaces along the entire distance from said first side to the corresponding interconnecting means and the other of said spaces extending through the tread between said tread element and the other of said tread portions and severing said second side and said upper and lower surfaces along the entire distance from said second side to the corresponding interconnecting means to permit canting of each of said tread portions relative to said tread element.

4,276,104

TRANSFER DRUM APPLICATION OF NARROW STRIP COMPONENTS TO A TIRE BEING BUILT ON A TIRE BUILDING DRUM

Robert S. Riggs, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 11, 1980, Ser. No. 111,155

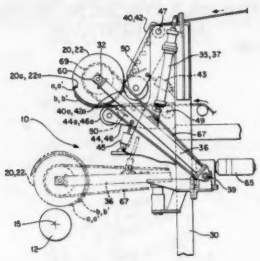
Int. Cl.³ B29H *17/20*

U.S. Cl. 156—123 R **7 Claims**

1. A method of building a tire on a cylindrical building drum, comprising:

wrapping an inner liner about the drum, wrapping a cord or wire-reinforced ply about the inner liner, applying a first pair of parallel axially spaced strip components to the cylindrical surface of transfermeans positioned parallel to and in axial register with the building drum but spaced radially therefrom, applying a second pair of parallel axially spaced strip components to said transfer means so as to locate a leading end of each of the second pair at an angular location spaced from the leading end of the respectively associated components of the first pair and so as to adhere the remaining lengths of the second pair to the radially outward surfaces of the first pair, the first-mentioned applying step being initiated before the termination of the later mentioned wrapping step, then rotating the transfermeans angularly to position the trailing ends of said second pair of components in a nip to be formed by

moving the transfermeans radially toward the building drum, and moving said transfermeans radially toward the building drum to form said nip, and rotating together the



transfermeans and the building drum so as to transfer the two pairs of strip components from the transfer means to the building drum.

4,276,105

PROCESS AND APPARATUS FOR STITCHING THE TREAD OF PNEUMATIC TIRES

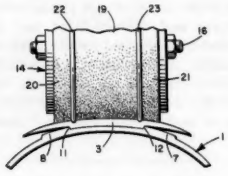
Rinaldo Gessaga, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Oct. 19, 1979, Ser. No. 86,305

Claims priority, application Italy, Oct. 31, 1978, 29262 A/78

Int. Cl.³ B29H *17/08*

U.S. Cl. 156—128 N **17 Claims**



1. A process for manufacturing pneumatic tires comprising a carcass, a tread and a reinforcing structure placed between the carcass and the tread, said reinforcing structure comprising at the ends of its layers of reinforcing material at least two discontinuities in thickness, each discontinuity in thickness being noticeable in two planes parallel to the equatorial plane of the tire, respectively up line and down line of the discontinuity, said thickness being greater in the axially outermost plane, said process being characterized by the fact of comprising, after the toroidal configuration of the carcass and of the reinforcing structure and the application of the tread, the following further steps of:

(a) stitching by means of brushes provided with filaments the central portion of the tread;

(b) stitching subsequently to the beginning of step (a) and during step (a), by means of brushes provided with filaments at least a length of the lateral portions of the tread overlying the reinforcing layers with greater thickness and by means of metallic discs the tread portions comprised between the central one and the lateral ones;

(c) stitching after step (b) by means of metallic discs the lateral portions of the tread overlying the reinforcing layers with greater thickness,

(d) stitching after step (c) by means of metallic discs the tread end.

4,276,106

LAYING ORIENTED FIBROUS WEBS

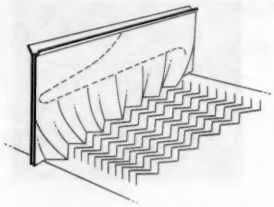
Kenneth Porter, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Nov. 21, 1979, Ser. No. 96,298

Claims priority, application United Kingdom, Aug. 15, 1979, 28435/79

Int. Cl.³ D04H *3/04, 3/10, 3/12*

U.S. Cl. 156—181 **9 Claims**



1. A process for the production of an ordered web from at least one fibrous strand, comprising forwarding a strand towards a moving collecting surface and imparting an oscillatory motion to the strand at a position above the collecting surface, the improvement being that the oscillating strand is passed between two closely spaced shaped plates which extend substantially from the place of oscillation down to the collecting surface whereon the strand is laid on the collecting surface in non-linear parallel courses, the strand being substantially equally spaced along its length from a preceding length of strand, said plates being substantially parallel to one another and to the plane of oscillation of the strands except for surface irregularities producing the non-linear shape of the parallel courses.

4,276,107

ADHESIVE-COATED IMPREGNATED POLYURETHANE FOAM

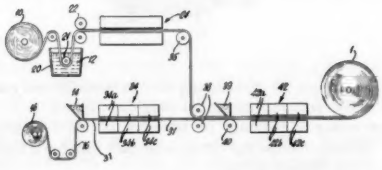
Joseph Pufahl, 10 Baer La., Locust Valley, N.Y. 11560

Division of Ser. No. 860,156, Dec. 14, 1977, Pat. No. 4,169,184, which is a continuation-in-part of Ser. No. 357,626, May 7, 1973, abandoned. This application Apr. 2, 1979, Ser. No. 25,835

The portion of the term of this patent subsequent to Sep. 25, 1996, has been disclaimed.

Int. Cl.³ B05D *5/10*

U.S. Cl. 156—238 **9 Claims**



1. A process for producing a resilient, non-porous, significantly non-absorbent pressure-sensitive adhesive tape that consists essentially of impregnating a substrate of open-celled, high density, flexible, resilient polyurethane foam with a polychloroprene latex, compressing said latex-impregnated substrate to cause said latex to penetrate through said polyurethane foam and permitting said substrate to return to its precompressed state; depositing a layer of a pressure-sensitive adhesive upon said impregnated substrate, and curing each of said polychloroprene and pressure-sensitive adhesive simultaneously or in separate steps.

2. A method as claimed in claim 1, wherein said pressure-sensitive adhesive is an acrylic resin and is deposited upon a

release tape and brought into contact with said impregnated substrate whereupon said adhesive is cured thereon.

4,276,108

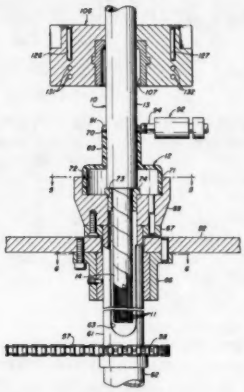
METHOD FOR BONDING A PLASTIC CASE TO A STUB CABLE

John S. Gellatly, LaGrange, and Fred T. Richter, LaGrange Park, both of Ill., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 72,393, Sep. 4, 1979, Pat. No. 4,229,155. This application Jun. 12, 1980, Ser. No. 158,769

Int. Cl.³ B29C *27/00*

U.S. Cl. 156—244.24 **3 Claims**



3. A method of joining an apertured casing part and a straight section of a plastic sheathed, stub cable having an offset coiled section, which comprises:

placing the straight section of cable in the aperture of the casing part;

orbiting the coiled section of cable about the longitudinal axis of the straight section to rotate the straight section about its longitudinal axis;

rotating the casing part in unison with the rotating straight section of cable;

extruding a bead of bonding material along the juncture of the apertured casing part and plastic sheathed cable; and

applying forces to the extruded bead to force portions of the bead into the juncture while shaping the remaining portion of the bead.

4,276,109

PROCESS FOR HIGH FREQUENCY HEAT SEALING OF TEXTILE SHEET MEMBERS

Ingo Siewert, Schmidstr. 11, 102 Berlin; Manfred Klaue, Frankenstr. 11, 1114 Berlin, and Peter Thietz, Baenschstr. 69, 1035 Berlin, all of German Democratic Rep.

Continuation of Ser. No. 878,920, Feb. 17, 1978, abandoned. This application Jan. 7, 1980, Ser. No. 110,386

Claims priority, application German Democratic Rep., Feb. 21, 1977, 197508

Int. Cl.³ B29C *27/04*

U.S. Cl. 156—273 **8 Claims**

1. A process of forming seams in textile structures which are substantially free of components that are individually high frequency heat sealable comprising subjecting to a high frequency current a textile structure containing a first component in the form of fibers which are subject to being heated upon exposure to a high frequency filed but which do not become thermoplastic upon such exposure, and a second component in the form of fibers which are subject to becoming thermoplastic upon exposure of the textile structure to a high frequency field and which becomes thermoplastic from heat generated in said first component, thereby producing one or more seams in said textile structure.

4,276,110

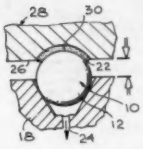
METHOD OF FORMING A SEPARATOR INTEGRAL WITH AN ELECTRODE

John M. Bilhorn, Mystic, Conn., assignor to Yardney Electric Corporation, Pawcatuck, Conn.

Continuation of Ser. No. 965,450, Nov. 30, 1978, abandoned, which is a division of Ser. No. 873,801, Jan. 31, 1978, Pat. No. 4,158,085. This application Mar. 24, 1980, Ser. No. 133,185

Int. Cl.³ B05D *1/12*; B32B *5/16*

U.S. Cl. 156—298 **9 Claims**



1. An improved method of forming a separator integral with an electrode, the method comprising:

a. coating the surface of each of a plurality of substantially spherical particles with a first coating;

b. placing said coating particles into and holding said particles in spaced relationship in a die so as to expose only a portion of said first coating of each of said particles;

c. contacting said exposed portion of said first coating with a second coating while said particles are in said die; and,

d. pressing said particles while in said die against an electrode surface for a time and at a pressure sufficient to effect embedment of said particles up to about 35% of the average diameter of said particles and to adhesively bond said particles to said surface by said second coating without crushing said particles, thereby forming an integral separator on the surface of said electrode, said first coating being either a primer for said second coating when said second coating is an adhesive or forming an adhesive with said second coating.

4,276,111

BLENDS OF ETHYLENE-ALKYL ACRYLATE COPOLYMERS WITH ROSIN ESTERS

Khalid A. Karim, and James H. Rea, both of Houston, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Jul. 31, 1980, Ser. No. 173,923

Int. Cl.³ C09J *7/00*; C08L *93/04*

U.S. Cl. 156—308.2 **12 Claims**

1. A polymer composition consisting essentially of:

(a) 100 parts by weight of an ethylene copolymer, and

(b) About 1 to 15 parts by weight of a rosin ester; said ethylene copolymer having polymerized therein about 70–98 weight % of ethylene and the balance an alkyl ester of acrylic or methacrylic acid; said rosin ester being an ester formed from a rosin acid and ethylene glycol, propylene glycol or glycerine.

10. In a method for heat sealing two films of an ethylene copolymer having polymerized therein about 70 to 98 weight % of ethylene and the balance an alkyl ester of acrylic or methacrylic acid by heating an assembly of the two films under pressure; the improvement which comprises employing films consisting essentially of said ethylene copolymer having uniformly dispersed therein about 1 to 15 parts by weight of a rosin ester in 100 parts by weight of said ethylene copolymer, whereby the heat sealing temperature of said film is lowered;

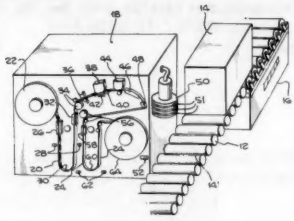
said rosin ester being an ester formed from a rosin acid and ethylene glycol, propylene glycol, or glycerine.

4,276,112

INDIVIDUALIZED LABEL APPLICATION SYSTEM

John B. French, Fountain Valley, and Oscar E. Muttoni, Huntington Beach, both of Calif., assignors to Nomax Corporation, Santa Ana, Calif.

Filed Dec. 7, 1978, Ser. No. 967,263
Int. Cl.³ G01G *23/38*
U.S. Cl. 156—360 **5 Claims**



1. An individualized label application system comprising:
an electrostatic printing assembly;
means for guiding a tape carrying pressure-sensitive labels in the forward direction through said electrostatic printing assembly;
means for dispensing printed labels from said tape and applying them to products;
means for including individualized information relating to the labeled product on each label;
means for reversing the movement of said tape and labels by a distance at least equal to the length of one label following the dispensing of a label;
means for stopping the reverse movement of said tape at a point where another label is ready for electrostatic printing with individualized information for the corresponding product;
said electrostatic printing means including corona means for printing bar code indicia on said label and wire matrix means for printing alphanumeric information on said label, and means for applying and fixing toner to electrostatic images formed both by said corona and by said matrix electrostatic image-applying means;
means for weighing each product to be labeled;
means for including information representing the weight of the product on said printed label;
means for disabling said electrostatic printing assembly on each forward movement of said tape following printing of the first label, whereby the subsequent adjacent labels which enter the electrostatic printing assembly are not printed until after reverse movement of the tape; and
said dispensing means including: a grooved cylinder; means for holding said labels onto said cylinder by air pressure; and spring finger means engaging the grooves in said cylinder for stripping said labels from said cylinder as it is rotated and for applying said labels to products.

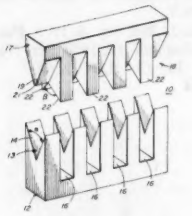
4,276,113

WINGED V-GROOVE FIBER OPTIC CLAMP AND SPLICER

W. John Carlsen, Natick; Mark L. Dakss, Sudbury, and Gary M. Lambert, Berlin, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Oct. 4, 1979, Ser. No. 81,730
Int. Cl.³ G02B *5/16*
U.S. Cl. 156—502 **12 Claims**

1. Apparatus for aligning and holding optical fibers along a predetermined axis comprising:
(a) a base member having a fiber engaging face, and
(i) a longitudinal recessed V-shaped groove along said face of said base member;
(ii) a plurality of rectangular transverse slots spaced along said groove, said slots extending to a depth exceeding said groove; and
(b) a cover having a face for engaging said base member, and



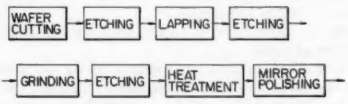
(i) a longitudinal extended V-shaped protuberance along said engaging face of said cover, said extended V-shaped protuberance corresponding in size and shape to said recessed V-shaped groove but being blunt at its apex; and
(ii) a plurality of rectangular transverse inverted V-shaped fingers spaced along said protuberance, and blunt at their apices, said fingers having a length not exceeding said depth of slots.

4,276,114

SEMICONDUCTOR SUBSTRATE AND A MANUFACTURING METHOD THEREOF

Yukio Takano, Kodaira; Masahiko Ogirima, Tokyo; Shigeru Aoki; Michiyoshi Maki, both of Hachioji, and Shigeo Kato, Mitaka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 6, 1979, Ser. No. 9,967
Claims priority, application Japan, Feb. 20, 1978, 53-18260
Int. Cl.³ H01L *21/304*
U.S. Cl. 156—645 **11 Claims**



1. A method of manufacturing a semiconductor substrate comprising the step of cutting a semiconductor crystal rod into the shape of a wafer, to obtain a semiconductor wafer, the step of grinding a rear surface of said semiconductor wafer with plane wheel means, to form a damaged layer whose maximum depth lies in a range of 2 μm to 20 μm in the rear surface, the step of etching the ground surface to decrease the curvature of said semiconductor wafer, and the step of mirror-polishing a front surface of the semiconductor wafer.

4,276,115

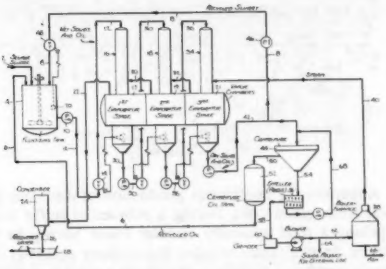
PROCESS AND APPARATUS FOR DEHYDRATING WASTE SOLIDS CONCENTRATES

Charles Greenfield, Murray Hill, and Anthony J. Bonanno, Parsippany, both of N.J., assignors to Hanover Research Corporation, East Hanover, N.J.

Filed Nov. 21, 1979, Ser. No. 96,391
Int. Cl.³ B01D *1/26*
U.S. Cl. 159—1 RW **14 Claims**

1. In a process for dehydrating initially water-containing waste solids concentrates chosen from the group consisting of secondary sewage sludge, digested sewage sludge, mixtures of

primary and secondary sewage sludges, those having relatively high quantities of iron-fatty acid soaps, those derived from packing industry wastes, and those containing animal manure, said concentrates having a non-fat solids concentration in the range 10% to 35% by weight on an oil-free basis, that process comprising the steps of (1) admixing such a waste solids concentrate with a relatively non-volatile oil to obtain a mixture which will remain fluid and pumpable after the removal of its water content by heat evaporation; (2) dehydrating the resultant oil-containing mixture by heat evaporation in a multi-stage



evaporator in a sequence of steps so ordered that the vapors evolved from each such step except the first are used as a heating medium in the preceding step, and (3) withdrawing a substantially anhydrous waste solids and oil slurry from a late stage of said evaporator, the improvement which comprises recycling at least a portion of the slurry so withdrawn and admixing it with the waste solids concentrate and oil in step (1) to form a mixture constituting a steady state feed material to said multi-stage evaporator having a non-fat solids content of from 25% to 60% on an oil-free basis.

4,276,116
PROCESS OF STRENGTHENING DILUTE PHOSPHORIC ACID

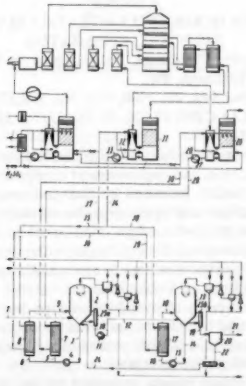
Walter Blumrich, Frankfurt am Main; Karl H. Dörr, Mainz; Hans J. König, Frankfurt am Main, and Ulrich Sander, Friedrichsdorf, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 22, 1979, Ser. No. 41,468

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1978, 2824010

Int. Cl.³ B01D *1/28*

U.S. Cl. 159—47 R **4 Claims**



1. In a process for concentrating dilute phosphoric acid in a phosphoric acid process characterized by a plurality of separate phosphoric acids cycles, wherein the phosphoric acid is concentrated in each cycle by a vacuum evaporator the improvement wherein the phosphoric acid in the phosphoric acid cycle is heated by indirect heat exchanger by heat released in the sulfuric acid of the absorption system of a sulfuric acid contact process, said sulfuric acid having a temperature of 80 to 200°C., said phosphoric acid in a phosphoric acid cycle associated with a first vacuum evaporator being indirectly heated in two heat exchangers which are connected in parallel, one of which is supplied with sulfuric acid from an end SO_3 absorber of said sulfuric acid contact process, the other of which is supplied with part of the sulfuric acid from the interstage absorber of said sulfuric acid contact process and the phosphoric acid in the phosphoric acid cycle associated with the second evaporator stage is heated by the remaining sulfuric acid from the interstage absorber.

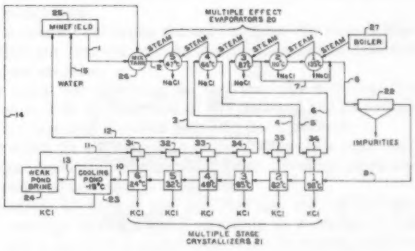
4,276,117
PROCESS OF TREATING POTASSIUM CHLORIDE BRINE BY EVAPORATION AND CRYSTALLIZATION

Donald H. Geesen, Wilcox, Canada, assignor to PPG Industries Canada Ltd., Regina, Canada

Continuation of Ser. No. 11,273, Feb. 12, 1979, abandoned. This application May 22, 1980, Ser. No. 152,219

Int. Cl.³ B01D *1/26*

U.S. Cl. 159—47 R **8 Claims**



1. In a method of producing potassium chloride from a brine thereof by concentrating the brine with respect to potassium chloride by multiple effect evaporators operated at progressively higher temperatures, wherein the multiple effect evaporators are backward fed, and then cooling the concentrated brine in multiple stage evaporative crystallizers operated at progressively lower temperatures, thereby precipitated potassium chloride crystals, the improvement which comprises cooling the brine in the hotter crystallizers of said multiple stage evaporative crystallizers utilizing feed streams to or feed streams between the cooler evaporators of said multiple effect evaporators, thereby heating the feed streams between the cooler evaporators.

4,276,118
DEINKING WASTE ELECTROPHOTOGRAPHY COPY PAPER

Thomas H. Quick, Sumner, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Oct. 9, 1979, Ser. No. 83,139

Int. Cl.³ D21L *5/02*

U.S. Cl. 162—5 **10 Claims**

1. The method of removing toner from electrophotographic copy paper containing said toner comprising

pulping said paper containing said toner to form an aqueous pulp and toner slurry which is mixable,

adding to said pulp slurry from 0.25 to 5% of the weight of the pulp fiber of a solid material selected from the group consisting of polystyrene, polyvinyl chloride, polyurethane, polypropylene, and polyacrylates,

adding to said pulp slurry at least 0.75% of the weight of the pulp fiber a chemical which is substantially insoluble in water, has a melting point which is in the range of the approximate melting point of said solid material and 75°, and is selected from a group consisting of a saturated aliphatic primary alcohol, a mixture of said primary alcohols, an unsaturated aliphatic primary alcohol, a mixture of said unsaturated alcohols, a saturated aliphatic secondary alcohol, a saturated aliphatic primary hydrocarbon, a mixture of said hydrocarbons, and a mixture of said hydrocarbons and said alcohols,

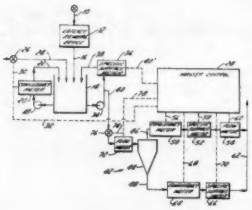
maintaining the temperature of said slurry at at least the melting point of said chemical for a period of at least one minute, and

after said period, removing said solid material and toner from said slurry.

4,276,119
METHOD AND APPARATUS FOR ON-LINE MONITORING OF SPECIFIC SURFACE OF MECHANICAL PULPS

Alkibiadis Karnis, Dollard des Ormeaux, and Paul M. Shallhorn, Vaudreuil, both of Canada, assignors to Domtar Inc., Montreal, Canada

Filed May 14, 1979, Ser. No. 38,631
Int. Cl.[3] D21F 7/06; G01N 21/00
U.S. Cl. 162—49 7 Claims



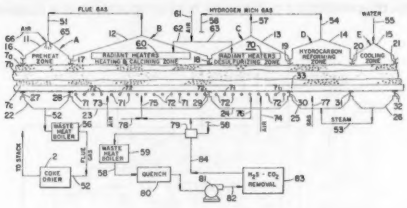
1. A method for on line determining the fibre specific surface distribution by weight of a pulp comprising, continuously separating a feed sample of said pulp in a hydrocyclone means into an overflow fraction and an underflow fraction measuring the parameters of at least two of said feed and each of said fractions required to determine their fibre mass flow rates and average specific surfaces, determining the said fibre mass flow rate and average specific surfaces, determining the specific surface distribution by weight of said feed sample based on said mass flow rates and the specific surfaces of said at least two of said feed and said fractions and a substantially cumulative normal distribution relationship for said pulp of cumulative specific surface fraction as a % by weight of feed to specific surface.

2. An apparatus for determining the fibre specific surface distribution by weight of a pulp comprising, hydrocyclone means having an overflow outlet and an underflow outlet, means for feeding said pulp to said hydrocyclone means thereby to fractionate said pulp into an underflow fraction and an overflow fraction, means for measuring the parameters of at least two of said feed, said overflow and said underflow fractions required to determine their fibre mass rates and average specific surfaces, means for determining said fibre mass flow rates and average specific surfaces, computing means for determining the fibre specific surface distribution of said pulp based on said fibre mass flow rates and specific surfaces and a cumulative normal distribution relationship for said pulp of cumulative specific surface fraction as a percent by weight of feed to specific surfaces.

4,276,120
PURIFICATION OF COKE

Irvin H. Lutz, Sagamore Hills, Ohio, assignor to Davy Inc., Cleveland, Ohio

Division of Ser. No. 945,586, Sep. 25, 1978, Pat. No. 4,208,307.
This application Jul. 10, 1979, Ser. No. 56,228
Int. Cl.[3] C10B 7/06, 49/04
U.S. Cl. 202—100 14 Claims



1. Apparatus for continuous production of electrode-grade carbon from green coke having a substantial sulfur content comprising a rigid generally circular frame having an outer generally circular frame member and an inner generally circular frame member; a circular grate having a portion mounted in fixed relation on said frame between said outer and inner generally circular frame members, said grate having a gas permeable hearth for carrying a bed of said coke with a depth of 1 to 2 meters, means for conveying green coke to said bed to provide a bed of said depth, means for supporting said circular frame for rotational movement about a vertical axis; stationary gas enclosing means above said grate and below said grate having wall means for providing in succession a series of separate treating zones including a preheat zone, a heating and calcining zone, a desulfurizing zone, and a cooling zone; means for passing heated gases through the bed of green coke on said grate to preheat the bed in said preheat zone; combustion heating means for heating the preheated coke in said heating and calcining zone to a calcining temperature of about at least 600° C. and for reducing the content of volatile matter at least 90 percent; means for passing the hot flue gas from said heating and calcining zone through the coke bed to capture entrained fine particles in the flue gas; means for passing a reducing gas through the coke bed on the grate in said desulfurizing zone and for maintaining the coke at a temperature of at least 550° C. to effect desulfurization of the coke under reducing conditions; and means for passing a cooling fluid through the bed of desulfurized coke in said cooling zone to recover heat before the coke is removed from the grate.

4,276,121
COKE OVEN DOOR SPILLAGE COLLECTION AND DISPOSAL APPARATUS

Robert C. Rogers, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Sep. 22, 1980, Ser. No. 189,372
Int. Cl.[3] C10B 39/04, 43/04, 33/10, 25/12
U.S. Cl. 202—227 8 Claims

1. In a coke oven pusher machine, including a pusher ram and a door machine, the improvement comprising:

(a) hopper means, mounted to the undercarriage of said pusher machine and operable to be extended to a position adjacent to the lower edges of the pusher side doorways of the coke ovens of the coke oven battery with which the coke oven pusher machine is associated, to collect material spilled from said coke ovens;

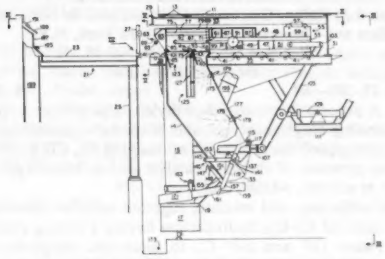
(b) powered means, mounted to said pusher machine, for extending said hopper means to said position adjacent and for retracting said hopper means to within said undercarriage of said pusher machine;

(c) gravity release means, mounted to the bottom of said hopper means, operable to release said material from

within said hopper means, when said hopper means has been retracted to within said undercarriage of said pusher machine;

(d) bin means, mounted to said undercarriage of said pusher machine, positioned beneath the retracted position of said hopper means, operable to collect said material released from said hopper means by said gravity release means;

(e) gate means, mounted to the bottom of said bin means, operable to dump said material which becomes accumulated within said bin means, said gate means which permits the flow of water therethrough from within said bin means;



(f) quench water spray means, mounted to said bin means, operable to spray water onto said material within said bin means; and

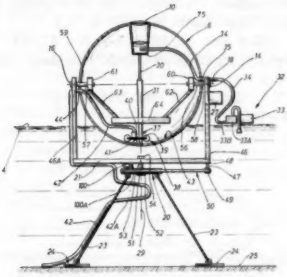
(g) conduit means, mounted to said bin means, operable to conduct away gases and airborne particulates which emanate from said material within said bin means.

4,276,122

SOLAR DISTILLATION APPARATUS

Wesley L. Snyder, 1103 Forest Home Dr., Houston, Tex. 77094

Filed Mar. 16, 1978, Ser. No. 880,882
Int. Cl.³ C02F 1/14
U.S. Cl. 202—234 **11 Claims**



1. A solar distillation apparatus to remove impurities from salt water or contaminated fresh water comprising:

an enclosed shell;

at least one heating element mounted within said shell;

at least one light focussing system supported by said shell for focussing solar radiation onto said heating element;

a control system for detecting the solar radiation and orienting the light focussing system with the path of the sun;

means for introducing salt water or contaminated fresh water into a heat transfer relationship with the heating element to vaporize said water within said shell;

a condensation surface comprising an inner surface of said shell for liquifying said vapor into potable fresh water condensate; and,

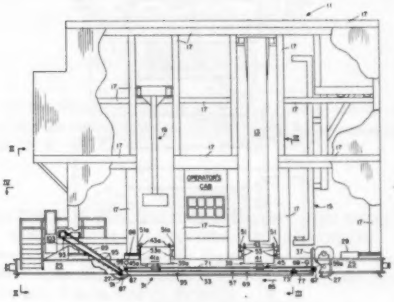
means for cleaning and reshaping said heating element.

4,276,123

COKE OVEN BATTERY BENCH CLEANING APPARATUS

William G. Emery, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Sep. 22, 1980, Ser. No. 189,374
Int. Cl.³ C10B 43/04, 33/14, 25/12
U.S. Cl. 202—241 **10 Claims**



1. In a coke oven battery door machine, including door removal apparatus, door seal and plug cleaning apparatus and door jamb cleaning apparatus, coke side bench cleaning apparatus comprising:

(a) means for collecting the coke spillage that is associated with the removal of coke side doors mounted onto said door machine;

(b) means for collecting the seal and plug scrapings that result from the operation of said door seal and plug cleaning apparatus mounted onto said door machine;

(c) means for collecting the jamb scrapings that result from the operation of said door jamb cleaning apparatus, mounted onto said door machine;

(d) means for moving said coke spillage, said seal and plug scrapings and said jamb scrapings to a discharge area within said door machine, said means for moving which is mounted onto said door machine;

(e) means for accumulating said coke spillage, said seal and plug scrapings and said jamb scrapings which have been moved to said discharge area, said means for accumulating which are mounted onto said door machine;

(f) means for conveying said coke spillage, said seal and plug scrapings and said jamb scrapings from said discharge area to said means for accumulating, said means for conveying which are mounted onto said door machine; and

(g) means for emptying, away from said coke side bench, said means for accumulating.

4,276,124

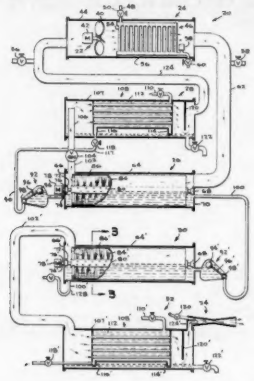
DISTILLATION SYSTEM FOR SEA WATER

Arthur E. Mock, East Wenatchee, Wash., assignor to Haakon Haakonsen, White Plains, N.Y., a part interest

Filed Jul. 17, 1975, Ser. No. 596,820
Int. Cl.³ B01D 1/14
U.S. Cl. 202—236 **11 Claims**

1. A nonscaling distillation system particularly adapted for distilling sea water, said system comprising a pump means for circulating air through the system, a heating means communicating with the outlet of the pump means for raising the temperature of the air, a first evaporator having evaporator surfaces, communicating with the heating means, and directing the heated air from the heating means against the evaporator surfaces, means for frequently flushing all of the evaporator surfaces with sea water to prevent a build-up of scale on the evaporator surfaces, a first condenser, a passageway between the first evaporator and the first condenser for directing the

heated and pressurized air from the first evaporator to the first condenser, a pressure regulating valve in the passageway for maintaining the pressure in the condenser at a significantly lower pressure than the pressure in the first evaporator, and a return passageway for communicating the first condenser with the pump means thereby providing a distillation system in



which pressurized air from the pump means may be heated in the heating means, flowed through the evaporator where it evaporates a portion of the sea water on the evaporator surfaces, flowed through the pressure regulating means at decreased pressures as it enters the first condenser where the water vapors are condensed, and returned to the inlet of the pump means as dry air.

4,276,125
PROCESS FOR PURIFICATION OF CRUDE OLEFINICALLY UNSATURATED NITRILE AND CONDENSER USEFUL FOR SAME PROCESS

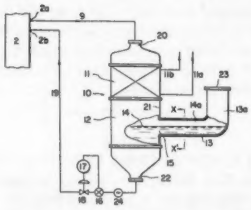
Katsuta Issei, Kurashiki, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 25, 1980, Ser. No. 115,594

Claims priority, application Japan, Feb. 2, 1979, 54-11110; Feb. 2, 1979, 54-11112

Int. Cl.³ B01D *3/00*

U.S. Cl. 203—4 **11 Claims**



1. A process for purifying a crude olefinically unsaturated nitrile containing hydrogen cyanide and water by feeding the crude olefinically unsaturated nitrile at a point above the middle of a rectifying column for stripping hydrogen cyanide, withdrawing and condensing a vapor of hydrogen cyanide from the top of the column while withdrawing the olefinically unsaturated nitrile and water from the bottom of the column, which process comprises withdrawing a vapor in the column at a point between the top of the column and the point of introduction of the crude olefinically unsaturated nitrile at a substantially constant rate and wherein the temperature is about 40° C. to about 75° C. cooling and condensing the vapor withdrawn in a condenser having an outlet for non-condensing gas while continuously withdrawing non-condensing gas in the vapor from the condenser, and returning the condensate liquid to the column at an intermediate point between the point of introduction of the crude olefinically unsaturated nitrile and the top of the column.

4,276,126
SEPARATION OF ETHYLENE GLYCOL FROM N-METHYLPYRROLIDONE

Bernard A. Saffer, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Nov. 30, 1979, Ser. No. 99,342

Int. Cl.³ B10D *3/36*

U.S. Cl. 203—69 **8 Claims**

1. A process for recovering ethylene glycol from a mixture comprising ethylene glycol and N-methyl-pyrrolidone, said ethylene glycol being obtained by reacting H_2, CO and H_2CO in the presence of rhodium catalyst and in N-methypyrrolidone as solvent, which comprises:

(a) subjecting said mixture, together with an azeotroping agent of C_7–C_{10} hydrocarbon having a boiling point between 110° and 190° C., to azeotropic distillation in a distillation zone whereby an overhead product and a bottoms product are produced, said overhead product comprising an azeotrope of said azeotroping agent and said glycol but containing no detectable amount of said methylpyrrolidone and said bottoms product comprising said N-methylpryrrolidone,

(b) separating said overhead product into a first phase comprising said azeotroping agent and a second phase comprising said glycol,

(c) returning at least a portion of said first phase to said distillation zone as reflux and,

(d) recovering said glycol from said second phase.

4,276,127
CHANNEL PLATE ELECTRON MULTIPLIERS

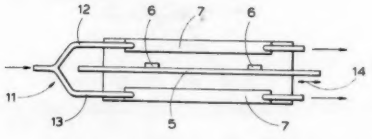
Henry D. Stone, Ashtead; Alan G. Knapp, Crawley; John R. Mansell, East Grinstead; Colin D. Overall, Reigate, and Derek Washington, Wallington, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 11, 1979, Ser. No. 47,392

Claims priority, application United Kingdom, Jun. 14, 1978, 26878/78

Int. Cl.³ C25D *7/06, 11/10*

U.S. Cl. 204—24 **2 Claims**



1. A method of making an anodized aluminum separator for use in a channel plate electron multiplier of the type comprising a stack of alternately arranged perforate laminar dynodes and perforate laminar separators, the perforations of said dynodes and separators being aligned to form electron multiplier channels, wherein each separator comprises a perforate, planar aluminum plate having an anodized layer on the plate surface, comprising the steps of:

placing a perforated aluminum plate between, and substantially equidistant from, a pair of planar cathodes in an oxalic acid anodizing bath;

applying a potential difference between the plate and cathodes and maintaining a constant current density of approximately 1 amp per square decimeter of separator area at the plate surface; while

maintaining the plate at a substantially equal temperature over its entire area; and

oscillating the plate, in its own plane, at a frequency in the range from 10 Hz to 30 Hz to remove any adhering gas bubbles therefrom; and subsequently

baking the plate to remove oxalic acid from said perforations.

4,276,128

HUMIDITY SENSING ELEMENT OF ELECTRIC CAPACITANCE CHANGE TYPE AND METHOD OF PRODUCING SAME

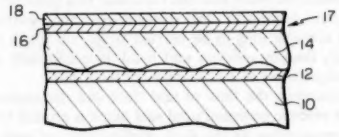
Atsushi Nishino; Akihiko Yoshida, and Nobukuni Ogino, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 21, 1979, Ser. No. 14,382

Claims priority, application Japan, Feb. 20, 1978, 53-18950; Mar. 15, 1978, 53-30422; Mar. 15, 1978, 53-30423; Mar. 15, 1978, 53-30424; Mar. 15, 1978, 53-30425

Int. Cl.³ H01G 9/05

U.S. Cl. 204—38 A **14 Claims**



1. A method of producing a humidity sensing element of a capacitance change type, the method comprising the steps of:

(a) anodizing a valve metal body to form a dielectric oxide layer film on a surface of said metal body;

(b) forming a semiconductive metal oxide layer which is gas-permeable on said dielectric film by thermal decomposition of an aqueous solution comprising a thermally decomposable metal salt applied to said dielectric oxide film;

(c) forming a gas-permeable layer of carbon on at least a portion of the outer surface of said semiconductive metal oxide layer;

(d) forming a gas-permeable and electronically conductive layer on said layer of carbon by applying a paint comprising a metal powder and a synthetic resin as a binder to the outer surface of said layer of carbon; and

(e) subjecting the product of step (d) to a vapor phase treatment for a period not shorter than 30 hours at a relative humidity of not lower than 90% at a temperature not lower than 80° C.

4,276,129

METHOD FOR PRODUCING FOIL ELECTRODES FOR ELECTROLYTIC CAPACITOR

Nobuyoshi Kanzaki, Jyoyo; Kenji Toyama, Uji; Katsutoshi Nakano, Jyoyo; Ryoichi Shimatani, Hirakata, and Fumio Kudo, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

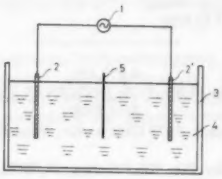
Filed Jun. 25, 1980, Ser. No. 162,738

Int. Cl.³ C25D 11/08, 11/10

U.S. Cl. 204—58 **3 Claims**

1. In the method for producing electrodes for use in aluminum electrolytic capacitor whose effective surface area is enlarged by electrochemically etching aluminum foil in an aqueous solution including hydrogen chloride and at least one additive capable of anodizing said aluminum foil with electric power supplied in alternating current, an improvement characterized in that;

the concentration of the hydrogen chloride in said solution is set at a range between 0.5 N and 3.5 N, the concentration of said additive is set at arrange between 0.001 mole/liter and 0.4 mole/liter, the frequency of said alternating current power supply is ranging from 5 Hz to 120 Hz and its



current density is ranging from 0.1 A/cm² to 0.6 A/cm², while the temperature of said solution is being maintained at 25° C.–60° C.

4,276,130

PROCESS FOR THE PRODUCTION OF HIGH PURITY AQUEOUS ALKALI HYDROXIDE SOLUTION

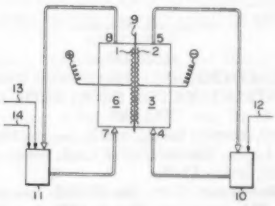
Maomi Seko, Tokyo; Shinsaku Ogawa, and Reiji Takemura, both of Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 856,484, Dec. 1, 1977, abandoned, which is a continuation of Ser. No. 703,234, Jul. 7, 1976, abandoned. This application May 25, 1979, Ser. No. 42,304

Claims priority, application Japan, Jul. 11, 1975, 50-85777

Int. Cl.³ C25B 1/16, 1/26

U.S. Cl. 204—98 **6 Claims**



1. A process for the electrolysis of an aqueous solution of sodium chloride in an electrolytic cell comprising an anode compartment and a cathode compartment separated by a cation exchange membrane to obtain an aqueous sodium hydroxide solution with a selected sodium chloride content of up to 400 ppm based on pure sodium hydroxide in the cathode compartment at high current efficiency by carrying out the electrolysis under conditions so that a preselected value of the expression:

$$(F(C-C_O)/KVt_m)$$

is not higher than 2.74×10^{-4}, by controlling the difference of concentration of sodium chloride in the anode compartment in eq. cm^{-3} and the limiting concentration of sodium chloride in the anode compartment in eq. cm^{-3} at a value from 0 to 0.001 eq. cm^{-3}; the symbols in the said expression being defined as follows:

F is the Faraday constant expressed as 96,500 sec. eq.$^{-1}$,

C is the concentration of sodium chloride in the anode compartment in eq. cm^{-3},

C_O is the limiting concentration of sodium chloride in the anode compartment in eq. cm^{-3},

K is a proportionality constant in sec. cm^{-3} ohm^{-1},

V is the voltage drop in the membrane in volts, and

t_m is the transport number of the sodium ions in the membrane:

and

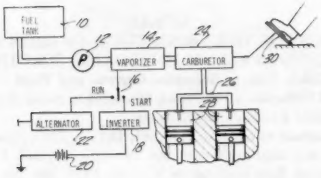
F is 96,500,
C−C_O is from 0 to 0.001,
K is from 0.8×10^5 to 1.67×10^5,
V is from 0.3 to 2, and
t_m is from 0.7 to 0.98.

4,276,131

VAPORIZED FUEL FOR INTERNAL COMBUSTION ENGINE

Arnold I. Feuerman, 5179 Corners Dr., West Bloomfield, Mich. 48033

Division of Ser. No. 726,177, Sep. 24, 1976, and Ser. No. 555,566, Feb. 27, 1975, Pat. No. 4,011,843. This application Apr. 7, 1980, Ser. No. 137,937
Int. Cl.³ C25B *1/02, 3/00*
U.S. Cl. 204—129 **7 Claims**



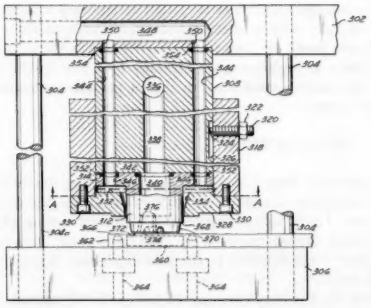
1. A fuel for an internal combustion engine comprising a vapor produced by passing an electric current through an electrolytically conductive emulsion of water and hydrocarbon, the current having a sufficient magnitude to vaporize the emulsion.

4,276,132

ELECTRO-CHEMICALLY MACHINED RING AND STRUT STRUCTURE FOR PROSTHETIC HEART VALVES

Bruce E. Fettel, Newport Beach; Paul E. Morris, Mission Viejo, and Leo J. Lichte, Riverside, all of Calif., assignors to Shiley Incorporated, Irvine, Calif.

Continuation-in-part of Ser. No. 870,685, Jan. 19, 1978, abandoned. This application Mar. 8, 1979, Ser. No. 18,566
Int. Cl.³ B23P *1/00*; A61F *1/22*
U.S. Cl. 204—129.1 **11 Claims**



1. A method for making an integral ring and strut structure for a prosthetic heart valve having an occluder movably mounted in a ring by a strut, said method comprising the steps of:

(1) placing a first side of a disc-shaped blank of hard, corrosion-resistant metal into close proximity with a first electrode having a first die face, said first die face being circular to form a ring of inside diameter approximately equal to the diameter of said first die face, and having a concavity for a strut which is integral with said ring;

(2) flowing electrolytic fluid between said first die face and said blank while simultaneously applying an electric potential between said electrode and said blank to cause an electric current to flow therebetween, said current causing metallic ions to be carried from said blank into said fluid thereby eroding said blank in conformity with the configuration of said first die face;

(3) continuing the flow of said fluid and the application of said electric potential until said blank is eroded to a shape corresponding to the configuration of a first side of said integral ring and strut structure;

(4) placing a second side of said blank into close proximity with a second electrode having a second die face, said second die face being circular to form a ring of approximately equal diameter to that ring formed by said first die face, and having a concavity for a strut which is integral with said ring and is matched to the concavity in said first die face;

(5) flowing electrolytic fluid between said second die face and said blank while simultaneously applying an electric potential between said electrode and said blank to cause an electric current to flow therebetween, said current causing metallic ions to be carried from said blank into said fluid, thereby eroding said blank in conformity with the configuration of said second die face; and

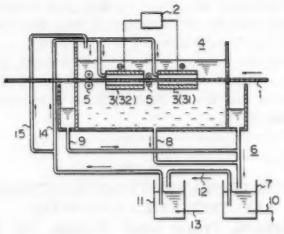
(6) continuing the flow of said fluid and the application of said electric potential until said blank is eroded to a shape corresponding to the final configuration of said integral ring and strut structure.

4,276,133

METHOD FOR CONTINUOUS ELECTROLYTIC DESCALING OF STEEL WIRE BY NON-CONTACT CURRENT FLOW

Hiroo Nagano, Kobe; Terumi Oda, Muko, and Takashi Fukuda, Kobe, all of Japan, assignors to Sumitomo Industries, Ltd., Osaka, Japan

Filed Sep. 24, 1979, Ser. No. 78,512
Claims priority, application Japan, Sep. 21, 1978, 53-116877
Int. Cl.³ C25F *1/06*
U.S. Cl. 204—145 R **8 Claims**

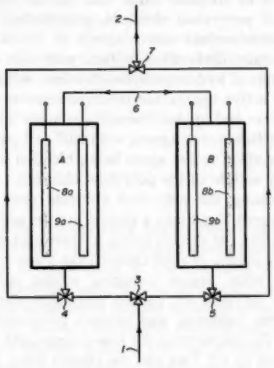


1. In a method of electrolytic descaling of a steel wire by non-contact current flow method, in which a direct current is supplied to a pair of electrodes and then to the steel wire through an electrolyte without using direct contact, the steel wire is transported past the pair of the electrodes immersed in the electrolyte throughout the operation, the electrodes are made of graphite and the electrolyte is comprised of 1–30% aqueous solution of an alkali metal chloride selected from the group consisting of sodium chloride, potassium chloride and lithium chloride, the improvement that the descaling is carried out in the presence of ferrous ions in the electrolyte, the ferrous ions being derived from ferrous chloride added to the electrolyte in an amount of more than 0.2% by weight of the electrolyte.

4,276,134
METHOD FOR REMOVING CHLORATE FROM CAUSTIC SOLUTIONS WITH ELECTROLYTIC IRON

Augusto Porta, Geneva, and Jacques Mosetti, Grand Lancy, both of Switzerland, assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 28, 1980, Ser. No. 172,923
Int. Cl.³ C25C 1/06
U.S. Cl. 204—153 8 Claims



4. A process for removing unwanted chlorate from a caustic solution by dissolution therein of metallic iron and simultaneous reduction of said chlorate by said iron and consecutively electrolytically removing said iron from the chlorate free solution which comprises

(A) contacting said solution of caustic to be purified with the iron metal in a form appropriate for its easy dissolving in the solution and consequent reducing of the ClO_3^- to chloride, then

(B) contacting the resulting solution containing dissolved iron with at least one conductive substrate, the latter being suitably adapted and polarized for electrolytically precipitating the iron in a form suitable for subsequently reducing chlorate as under (A) above, thus causing said iron to deposit thereon in pulverulent metallic form, thus providing a solution substantially free from iron and ClO_3^- ions,

(C) separating said purified portion of the solution and

(D) periodically using said substrates when sufficiently coated with said metallic iron to treat a yet untreated portion of the caustic solution as under (A) above and periodically, after consumption of said available deposited iron, re-using said substrates for recovering said dissolved iron as under (B) above.

4,276,135
PHOTOCURABLE ORGANOPOLYSILOXANE COMPOSITIONS

Yasuhiko Sato; Jun Koizumi, and Yuji Tokushige, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co. Ltd., Tokyo, Japan

Filed Oct. 23, 1979, Ser. No. 87,344
Claims priority, application Japan, Nov. 6, 1978, 53-136508
Int. Cl.³ B32B 15/08, 27/16; C08F 2/50, 30/08
U.S. Cl. 204—159.13 11 Claims

1. A photocurable organopolysiloxane composition which comprises

(a) 100 parts by weight of an acryloyloxy-containing organopolysiloxane represented by the average unit formula

$$[X_2N(CH_2CH_2NH)_mR^1]_a SiO_{\frac{4-a-b}{2}}R^2_b,$$

where R^1 is a divalent hydrocarbon group, R^2 is a monovalent hydrocarbon group, at least one of the groups denoted by X is an acryloyloxy-substituted 2-hydroxyalkyl group represented by the general formula

$$H_2C{=}C(R^3)C(=O)OR^4CH(OH)CH_2-,$$

in which R^3 is a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms and R^4 is a divalent hydrocarbon group, the remainder of the groups denoted by X each being a hydrogen atom, n is zero or a positive integer not exceeding 4, a is a positive number not exceeding 3 and b is zero or a positive number smaller than 3 with the proviso that a+b is a positive number not exceeding 3,

(b) from 0.1 to 20 parts by weight of an epoxy-containing compound having at least one epoxy group in a molecule, and

(c) a photosensitizer.

4,276,136
RADIATION CURABLE COATING COMPOSITION COMPRISING AN ETHYLENICALLY UNSATURATED OLIGOMER AND AN ETHYLENICALLY UNSATURATED COPOLYMERIZABLE ULTRA-VIOLET ABSORBER

Bruce A. Gruber, Worthington, Ohio, and Donald H. Lorenz, Basking Ridge, N.J., assignors to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 6,787, Jan. 26, 1979, Pat. No. 4,178,303. This application Aug. 30, 1979, Ser. No. 71,356
Int. Cl.³ C08F 2/46
U.S. Cl. 204—159.22 19 Claims

1. A radiation curable coating composition comprising:

A. An oligomer of Formula I:

$$CH_2{=}C(R^1)C(=O)O{-}Y{-}O(C=O)C(R^1){=}CH_2 \quad (I)$$

wherein:

R^1 is hydrogen or methyl; and

Y is a divalent urethane containing radical produced from a polyol and a diisocyanate; and

B. a copolymerizable ultra-violet light absorber compounds of Formula IV:

$$(Ar)_1(Ar)_2C{=}C(CN)C(=O)OXOZ \quad (IV)$$

where:

$(Ar)_1$ and $(Ar)_2$ are aromatic carbocyclic nuclei of the benzene and naphthalene series and are independently selected from the group consisting of phenyl or phenyl substituted with alkyl, halo, alkoxy, carboxy, carbalkoxy, cyano, acetyl, benzoyl, phenyl, alkyl phenyl, phenoxy phenyl, alkyl substituted phenoxy, or alkoxy phenyl substituted phenyl and naphthyl;

X is C_2–C_{17} alkylene, unsubstituted or substituted with

halo, cyano, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_6 alkoxyalkyl, or C_1–C_6 alkoxyalkyleneoxy; and

Z is a copolymerizable radical selected from the group consisting of acryloyl, C_3–C_{12} alkylacryoyl, C_3–C_{12} acryloxyalkyl, C_3–C_{12} acryloxyhydroxyalkyl, and C_3–C_{12} alkylacryloxyhydroxyalkyl.

4,276,137

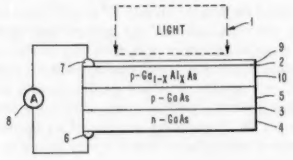
CONTROL OF SURFACE RECOMBINATION LOSS IN SOLAR CELLS

Harold J. Hovel, Katonah, and Jerry M. Woodall, Bedford Hills, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 23, 1979, Ser. No. 59,855

Int. Cl.³ H01L *31/18*

U.S. Cl. 204—164 **1 Claim**



1. The process of fabricating a solar cell comprising in combination:

providing a monocrystalline GaAs semiconductor solar cell device body with a light receiving surface and having a p-n junction essentially parallel to said light receiving surface;

providing a layer of GaAlAs on said light receiving surface;

depositing a layer of aluminum over said GaAlAs layer of the order of 100 A thick;

oxidizing said device body as the anode in an RF field of the order of 30 to 100 volts positive in an evacuated environment containing oxygen at a pressure of the order of 10^{-3} to 1^{-2} Torr for a time sufficient to form an oxide layer from said GaAlAs layer of the order of 700 to 1000 A thick covered by an aluminum oxide layer; and

annealing said device body in the presence of hydrogen at a temperature of the order of 400° to 500° C. for a period of the order of 15 minutes to 1 hour.

4,276,138

METHOD FOR REDUCING ELECTROSTATIC CHARGING ON SHAPED ARTICLES OF POLYVINYL CHLORIDE RESINS

Michihiko Asai, Fujisawa; Yoshio Suda, Hachioji; Kiyoshi Imada, Omiya; Susumu Ueno, and Hirokazu Nomura, both of Ibaragi, all of Japan, assignors to Agency of Industrial Science & Technology and Shin-Etsu Chemical Co., Ltd., both of, Japan

Filed Jun. 22, 1979, Ser. No. 51,148

Claims priority, application Japan, Jun. 27, 1978, 53-77807; Oct. 31, 1978, 53-133956

Int. Cl.³ C08J *5/18, 5/00;* C08K *5/04, 5/42*

U.S. Cl. 204—165 **3 Claims**

1. A method of reducing static electricity on the surface of articles made of polyvinyl chloride resin comprising:

(A) blending a polyvinyl chloride resin with a surface active agent chosen from the group consisting of, primary amine salts, secondary amine salts, tertiary amine salts, quaternary amine salts, pyridinium salts, which are cationic surface active agents, sulfonated oils, metal soaps, sulfonated ester oils, sulfonated amide oils, sulfuric oil esters of olefins, sulfuric acid esters of aliphatic alcohols, ester salts of alkylsulfuric acids, aliphatic acid, ethylsulfonates, alkylsulfonates, alkylnaphthalene sulfonates, alkylbenzene sulfonates, reaction products of naphthalenesulfonic acid and formalin, sulfonates of succinic acid esters and salts of phosphoric acid esters, which are anionic surface active agents, and aliphatic carboxylic acid esters of polyvalent alcohols, addition products of ethylene oxides with aliphatic alcohols, addition products of ethylene oxide with aliphatic carboxylic acids, addition products of ethylene oxide with aliphatic amines and aliphatic amides, addition products of ethylene oxide with alkyl phenols, addition products of ethylene oxide with alkyl naphthols, addition products of ethylene oxide with partial carboxylic acid esters of polyvalent alcohols, polyethylene glycols and amphoteric surface active agents of the carboxylic acid type, betaine derivatives, sulfuric acid ester salts, sulfuric acid esters of hydroxyethylimidazoline, sulfonic acid type surface active agents, taurine condensation type succinic acid esters and imidazolinesulfonic acids which are nonionic surface active agents; with 0.03 to 1 parts by weight of the surface active agent being blended with each 100 parts by weight of the polyvinyl chloride;

(B) fabricating the polyvinyl chloride resin and surface active agent blend into a shaped article; and

(C) subjecting the shaped article to treatment with low-temperature plasma of a gas chosen from a group consisting of helium, neon, argon, nitrogen, nitrous oxide, nitrogen dioxide, oxygen, air, carbon monoxide, carbon dioxide, hydrogen, halogens, and halogen compounds, the pressure of the gas forming the low-temperature plasma being from 0.01 to 1.0 Torr and the plasma being generated by applying electrical power to the gas.

4,276,139

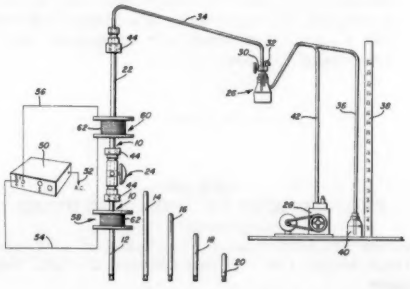
PROCESS FOR MAGNETIC SEPARATION AND COLLECTION OF VIABLE FEMALE AND MALE SPERMATOZOA

Rommon L. Lawson, 7905 Bangor Ave., Lubbock, Tex. 79424

Continuation-in-part of Ser. No. 933,988, Aug. 16, 1978, Pat. No. 4,225,405, which is a continuation-in-part of Ser. No. 805,869, Jun. 13, 1977, abandoned. This application Oct. 9, 1979, Ser. No. 83,173

Int. Cl.³ G01N *27/26*

U.S. Cl. 204—180 R **12 Claims**

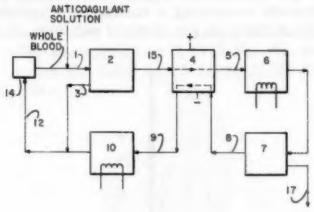


1. A process for separating and collecting viable female spermatozoa (X-chromosome) and male spermatozoa (Y-chromosome) in a semen sample, which process comprises subjecting the semen sample to a magnetic field to cause the female (X-chromosome) and male (Y-chromosome) spermatozoa to migrate in opposite directions along the direction of said magnetic field.

4,276,140
ELECTRODIALYSIS APPARATUS AND PROCESS FOR FRACTIONATING PROTEIN MIXTURES

Surendar M. Jain, Watertown, Mass., assignor to Ionics Inc., Watertown, Mass.

Filed Jan. 10, 1980, Ser. No. 111,144
Int. Cl.³ B01D *57/02*
U.S. Cl. 204—180 P **8 Claims**

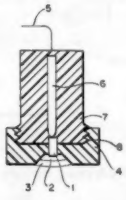


1. A process for fractionating liquid protein mixtures containing dissolved salts, by employing an electrodialysis apparatus having one or more pairs of concentrating and diluting chambers, the chambers being defined by alternating anion and cation exchange membranes located between terminally positioned anode and cathode electrodes, said process comprising passing the said protein mixture into the diluting chambers, impressing a direct current across said electrodes to reduce the salt content of said protein mixture by causing the passage of salt from the diluting chambers into the concentrating chambers, collecting the desalted protein mixture from said diluting chambers, separating and removing one or more protein components from the said desalted protein mixture and thereafter passing the resulting salt depleted mixture into said concentrating chambers whereby said salts entering said concentrating chambers from the adjacent diluting chambers will substantially restore the original salt content of said desalted protein mixture.

4,276,141
SOLID STATE ION SELECTIVE ELECTRODES

John J. Hawkins, Santa Ana, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation-in-part of Ser. No. 880,908, Feb. 24, 1978, abandoned. This application Jun. 27, 1979, Ser. No. 52,639
Int. Cl.³ G01N *27/46*
U.S. Cl. 204—195 M **60 Claims**



1. A solid state electrode for use in determination of ion concentration in an aqueous solution comprising:

(a) an electrically conductive element;

(b) a first lipophilic-hydrophobic layer in intimate contact with said element, said first layer comprising:

(i) an adhesive, lipophilic-hydrophobic polymer having an intrinsic viscosity of from about 0.4 to about 0.9 ml/g; and

(ii) a lipophilic-hydrophobic plasticizer; and

(c) a second lipophilic-hydrophobic layer in intimate contact with said first layer, said second layer comprising:

(i) a lipophilic-hydrophobic polymer having an intrinsic viscosity of from about 1 to about 1.5 ml/g;

(ii) a lipophilic-hydrophobic plasticizer; and

(iii) a lipophilic-hydrophobic ion-selective ligand.

4,276,142
ELECTROCHEMICAL SENSOR, PARTICULARLY FOR INTERNAL COMBUSTION ENGINE EXHAUST GAS COMPOSITION DETERMINATION, AND METHOD OF ITS MANUFACTURE

Bernhard Topp, Gerlingen; Karl-Hermann Friese, Leonberg, and Wolf-Dieter Haecker, Asperg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 12, 1979, Ser. No. 57,253
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1978, 2831478
Int. Cl.³ G01N *27/58*; C23C *15/00*; B05D *5/12*
U.S. Cl. 204—195 S **21 Claims**

1. Method to manufacture a sensor element to sense the composition of gases with respect to a reference gas, comprising

providing a solid electrolyte body (**10**) having a first surface adapted for exposure to the reference gas;

a first sensing electrode (**13**) applied to said first surface;

a second surface adapted for exposure to the reference gas, and a second electrode (**12**) applied to said second surface, and in which the first electrode has dispersed therein a material impeding or inhibiting recrystallization of the material of the first electrode at elevated temperatures,

wherein, in accordance with the invention,

the method of forming and applying the first electrode and the recrystallization-impeding or inhibiting material comprises a plurality of rapidly sequential steps of alternately rapidly vaporizing platinum, or a platinum metal alloy, and a metal which, when oxidized, will form said recrystallization-impeding or inhibiting material, within an atmosphere containing residual oxygen;

and controlling the composition of the electrode layer by controlling the relationship of the vaporization time of the platinum, or platinum metal, with respect to the other metal forming said oxide.

17. Electrochemical sensor to determine the composition of a test gas comprising

a solid electrolyte body (**10**) having one surface exposed to the test gas;

a first porous electrode (**13**) comprising a porous layer of platinum or a platinum metal alloy which catalyzes the test gas to establish a thermodynamic stable state, located on the surface of said body;

a porous protective coating (**14**) covering said electrode (**13**);

a second electrode (**12**) located at another surface of said body, said other surface being exposed to a reference gas;

and a carbide of a metal, which carbide is stable at the operating temperature of the sensor in the presence of the platinum or platinum metal alloy of said first electrode dispersed within the platinum or platinum metal alloy of said first electrode to impede or inhibit recrystallization of the platinum or platinum metal alloy of the first electrode.

4,276,143
APPARATUS FOR CONTINUOUSLY MEASURING ION CONCENTRATIONS

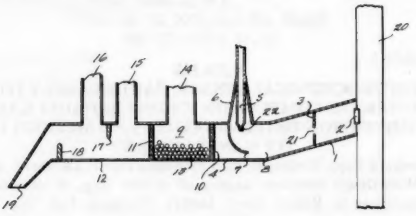
Franz-Ludwig Dahm, Alzenau; Herbert Diehl, Frankfurt; Kurt Eiermann, Pfungstadt; Reinhold Lamberty, Bornheim-Walberberg, and Wolfgang Nischk, Wesseling, all of Fed. Rep. of Germany, assignors to Deutsche Gold und Silber Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Nov. 15, 1979, Ser. No. 94,800

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1978, 2850137

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—195 M **9 Claims**



1. Apparatus for the continuous measurement of ion concentrations in solution by ion sensitive electrodes, particularly for the measurement of cyanide ion concentrations in strong hydrochloride solutions in the presence of cyanogen chloride, comprising in series:

means for supplying solution to be measured to said apparatus;

a dosage device connected to said supplying means for dosing the solution with a dosing liquid, said device including a mixing chamber, an inlet to said chamber for dosing liquid including restriction means for forming at least one jet of the dosing liquid directed into said chamber, deflector means in the path of the jet, and an inlet to said chamber for the solution including restriction means for forming at least one jet of the solution directed into said chamber toward and at an angle to the liquid dosing jet;

a degassing section connected to said dosage device and having an outlet for gas; and

a measuring cell containing ion-sensitive electrodes connected to said degassing section.

4,276,144
OXYGEN ELECTRODE AND METHOD FOR PREPARATION THEREOF

Allen W. Hahn; Michael F. Nichols, both of Columbia; Ashok K. Sharma, Rolla, and Eckhard W. Hellmuth, Kansas City, all of Mo., assignors to The Curators of the University of Missouri, Columbia, Mo.

Filed Feb. 20, 1980, Ser. No. 123,091

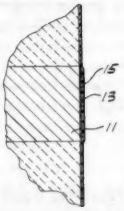
Int. Cl.³ G01N *27/30, 27/40*; B05D *3/14*

U.S. Cl. 204—195 P **37 Claims**

1. An oxygen electrode, adapted for use in polarography, galvanometry or amperometry, that is resistant to poisoning and effective for accurate, reproducible current and voltage measurements, comprising a conductor constituted of a metal which catalyzes the cathodic reduction of oxygen, an electrical lead electrically connected to said conductor, an insulating jacket covering all of said conductor except a working surface thereof that is adapted to communicate with an oxygen-containing environment for the cathodic reduction of oxygen, said conductor having a layer of an oxide of said metal at said surface, and a thin polymeric coating over said oxide layer and securely adhered to said surface, said coating comprising a polymer produced by glow discharge polymerization of an aliphatic hydrocarbon and having such properties as to permit reduction of oxygen at said electrode by electrons supplied at said surface through said lead and conductor.

21. A method for producing an oxygen electrode, adapted for use in polarography, galvanometry or amperometry, that is resistant to poisoning and effective for accurate, reproducible current and voltage measurement, the method comprising the steps of:

generating a plasma from a gas in a low pressure chamber containing the working surface of an oxygen electrode, said electrode comprising a conductor constituted of a metal which catalyzes the cathodic reduction of oxygen,



and an insulating jacket that covers all of said conductor except said working surface that is adapted to communicate with an oxygen-containing environment for the cathodic reduction of oxygen, said conductor having a layer of an oxide of said metal at said surface;

introducing an aliphatic hydrocarbon gas into said low pressure chamber;

polymerizing said hydrocarbon by action of said plasma thereon; and

depositing a thin adherent coating of said polymer over said oxide layer on said working surface.

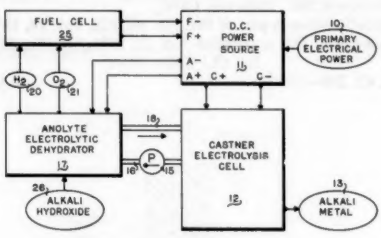
4,276,145
ELECTROLYTIC ANOLYTE DEHYDRATION OF CASTNER CELLS

Stephen F. Skala, 3839 S. Wenonah Ave., Berwyn, Ill. 60402

Filed Jan. 31, 1980, Ser. No. 117,240

Int. Cl.³ C25B *1/04, 9/00*

U.S. Cl. 204—247 **3 Claims**



1. A system for dehydrating molten alkali hydroxide anolyte comprising

a Castner cell having an anolyte portion wherein water is formed,

an anolyte electrolytic dehydrator for electrolytically decomposing water in the anolyte to hydrogen and oxygen and having a chamber to collect the hydrogen and a chamber to collect the oxygen,

conduits and pumping means to transport the anolyte in a path with includes the Castner cell and the anolyte electrolytic dehydrator, and

a power source having one output to provide a higher voltage for the Castner cell to produce alkali metal and having

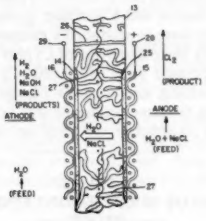
another output to provide a lower voltage for the anolyte electrolytic dehydrator to decompose the water but not sufficient to decompose the alkali hydroxide.

4,276,146

CELL HAVING CATALYTIC ELECTRODES BONDED TO A MEMBRANE SEPARATOR

Thomas G. Coker, Waltham, and Anthony B. LaConti, Lynnfield, both of Mass., assignors to General Electric Company, Wilmington, Mass.

Division of Ser. No. 931,413, Aug. 7, 1978, Pat. No. 4,209,368. This application Dec. 7, 1979, Ser. No. 101,117
Int. Cl.³ C25B *11/03, 11/06, 13/08, 9/00*
U.S. Cl. 204—266 **12 Claims**



1. An electrolysis cell for producing halogens and an alkali metal hydroxide comprising:

(a) a porous, hydraulically permeable membrane dividing said cell into anolyte and catholyte chambers, said membrane consisting solely of polymeric material,

(b) anode and cathode electrodes positioned on opposite sides of said membrane,

(c) one of said electrodes comprising a gas permeable, porous catalytic electrode bonded to one side of said polymeric membrane,

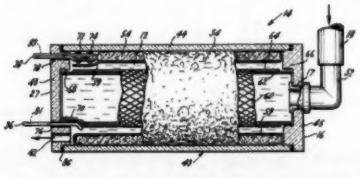
(d) means to introduce a aqueous alkali metal halide into said anolyte chamber to produce halogen gas at said anode, said halide being pressurized to produce hydraulic transport of anolyte and alkali metal cations through said pores to said catholyte chamber to produce alkali metal hydroxides at said cathode, said pressurized anolyte preventing back migration of hydroxide or hydroxyl anions to said anolyte chamber.

4,276,147

APPARATUS FOR RECOVERY OF METALS FROM SOLUTION

Randolph L. Epner, 118 E. 92 St., New York, N.Y. 10028, and Ahmad Sam, 671 Forest Ave., Paramus, N.J. 07652

Filed Aug. 17, 1979, Ser. No. 67,303
Int. Cl.³ C25B *7/00*
U.S. Cl. 204—272 **14 Claims**



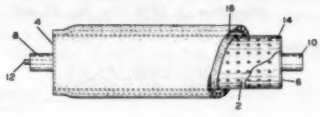
1. Apparatus for electrolytic recovery of metal from a solution contained in a tank adapted to be placed directly in said tank comprising a housing including an inlet and outlet to permit circulation of the solution containing the metal to be recovered therethrough, an anode positioned within said housing, a cathode positioned within said housing in spaced apart relationship with said anode to permit the solution to flow between said anode and cathode, said cathode including a base layer of cellular nonconductive material having a conductive layer thereon of sufficient thickness to render said cathode operative, said anode and cathode being adapted to be coupled to a source of DC current, whereby solution may be circulated through said housing and metal from said solution deposited in said cathode from which it may be recovered.

4,276,148

EXPANDABLE MANDREL

Jacob A. Otthofer, Jr., Lancaster, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Aug. 18, 1980, Ser. No. 178,977
Int. Cl.³ C25D *1/02, 1/10*
U.S. Cl. 204—281 **1 Claim**



1. The mandrel for forming seamless hollow cylinders comprising in combination:

(a) a pair of axially aligned, spaced apart end plates, a journal positioned centrally of each end plate and extending outwardly from the end plate, said journals extend from opposite sides of the two end plates and not into the area between the two end plates,

(b) a cylindrical perforated metal tube connected to said end plates and interconnecting together said two end plates,

(c) means for supplying air to the region between the perforated metal tube and the two end plates,

(d) a paper positioned over the periphery of the perforated metal tube to cover the perforations therein, said paper not covering the surface of the perforated metal tube in the region adjacent the edges of the tubes,

(e) a rubber jacket being positioned over the perforated metal tube and being bonded to the area of the perforated metal tube not covered by the paper, and

(f) said means which provide air to the interior of the perforated metal tube providing air to the interior of the tube whereby the air will pass through the perforated metal tube and will push past the release paper to apply pressure on the rubber jacket to expand said rubber jacket, release of said air pressure will permit contraction of said rubber jacket so that a matrix element may be positioned on the outside of the rubber jacket and due to the expansion and contraction of the rubber jacket, be held on the mandrel or released from the mandrel.

4,276,149

STEAM PASSIVATION OF METAL CONTAMINANTS ON CRACKING CATALYSTS

Arthur W. Chester, Cherry Hill, and William A. Stover, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 25, 1979, Ser. No. 51,597
Int. Cl.³ C10G *11/05, 11/18*
U.S. Cl. 208—120 **24 Claims**

6. A process for catalytic cracking of hydrocarbons wherein

a. a metal-containing hydrocarbon feed is introduced into a cracking region;

b. said feed is contacted with a zeolite cracking catalyst under cracking conditions whereby the feed is cracked;

c. the cracked feed is removed from said cracking region for further processing;

d. said catalyst which is now deposited with coke formed during cracking is contacted with oxygen in a regenera-

tion zone in order to burn off a desired amount of coke; and

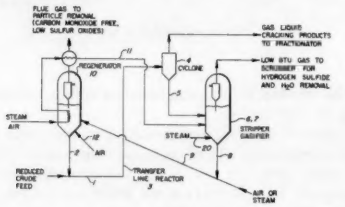
e. metals deposited on said cracking catalyst from said feed and tending to deactivate said cracking catalyst are passivated by removing a slip stream of said cracking catalyst from the regeneration zone and contacting said slip stream with steam at a temperature between about 1000° F. and about 1400° F., for a period of time between about ½ hour and about 16 hours and then returning said catalyst back to the regeneration zone.

4,276,150

FLUID CATALYTIC CRACKING OF HEAVY PETROLEUM FRACTIONS

Keith W. McHenry, Jr., Glen Ellyn, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 5, 1979, Ser. No. 91,469
Int. Cl.³ C10G *11/18*
U.S. Cl. 208—120 **12 Claims**



1. A process for the fluid catalytic cracking of hydrocarbon feedstocks containing organic sulfur compounds wherein the sulfur content of said feedstock is in the range of from about 0.1 weight percent to about 12 weight percent whereby (i) the said feedstocks are cracked to produce useful products, (ii) sulfur oxide emissions from sulfur-containing coke deposits on the used cracking catalyst are reduced to hydrogen sulfide and emitted in a product gas comprising low B.T.U. gas and hydrogen sulfide, (iii) coke deposits on the used cracking catalyst are reduced in amount sufficiently by regeneration whereby the said catalyst is suitable for re-use, (iv) sulfur oxide emissions in the flue gas from the regenerator are reduced in amount, which process comprises:

(a) cracking said feedsock at a temperature from about 850° F. to about 1500° F. in a reaction zone in contact with fluidized solid particles, the said particles comprising a cracking catalyst;

(b) withdrawing said particles from said reaction zone;

(c) subjecting said particles to a stripping zone wherein steam is present in sufficient amount and sufficient temperature to strip volatile deposits from said particles;

(d) withdrawing said particles from said stripping zone;

(e) contacting said particles with steam and oxygen-containing gas in at least one gasification zone wherein temperature and amount of said steam and oxygen-containing gas are effective to partially remove sulfur-containing coke deposits from said particles through formation of a product gas comprising carbon monoxide, carbon dioxide, hydrogen and hydrogen sulfide;

(f) withdrawing said particles having a reduced coke content from said gasifying zone;

(g) subjecting said particles to an oxidizing zone at a sufficient temperature containing sufficient oxygen to cause flue gas emitted from said oxidizing zone to be essentially free of carbon monoxide; wherein temperature in said oxidizing zone is lower than temperature in said gasifying zone; and

(h) withdrawing the said particles from said oxidizing zone whereby the said particles are in a condition suitable for re-use in the reaction zone.

4,276,151

NOVEL REFORMING CATALYSTS

Charles J. Plank, Woodbury; Edward J. Rosinski, Pedricktown, both of N.J., and Edwin N. Givens, Bethlehem, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 86,565, Oct. 19, 1979, abandoned, which is a continuation of Ser. No. 723,847, Sep. 16, 1976, abandoned, which is a continuation of Ser. No. 503,542, Sep. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 262,410, Jun. 13, 1972, abandoned. This application Mar. 28, 1980, Ser. No. 134,818
Int. Cl.³ C10G *35/06*
U.S. Cl. 208—138 **8 Claims**

1. A process for reforming which comprises contacting a naphtha charge stock under reforming conditions with a composite which comprises about 0.25% to about 25% by weight of ZSM-5 type zeolite and a platinum group metal reforming catalyst whereby there is produced a gaseous effluent containing a substantially increased yield of C_3 plus C_4 products and a substantially decreased yield of C_1 plus C_2 products as compared with reforming said naphtha charge under reforming conditions giving the same octane number liquid product in the presence of said platinum group metal reforming catalyst.

4,276,152

REFORMING OF SULFUR-CONTAINING CHARGE STOCK

William D. McHale, Mantua, and Hans-Juergen Schoennagel, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Sep. 24, 1979, Ser. No. 78,355
Int. Cl.³ C10G *35/08*
U.S. Cl. 208—139 **16 Claims**

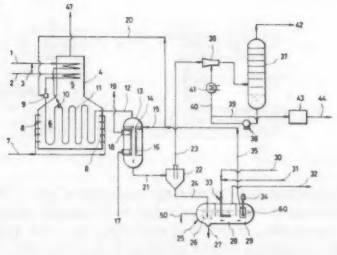
1. In a process for reforming a hydrocarbon charge under reforming conditions in the presence of a reforming catalyst contained in a reforming zone wherein said charge conducted to said reforming zone is initially substantially sulfur-free and wherein excessive hydrocracking of said charge, with concomittant loss in the activity of said catalyst is reduced by the introduction of sulfur into said charge, the improvement which comprises utilizing as said catalyst a composition consisting essentially of a minor proportion of platinum on a support and a minor proportion of iridium on a separate support.

4,276,153

PROCESS FOR THERMAL CRACKING OF HYDROCARBONS AND APPARATUS THEREFOR

Masami Yoshitake, Sakai, and Fumiaki Yamaguchi, Iwakuni, both of Japan, assignors to Mitsui Engineering and Shipbuilding Co., Ltd. and Mitsui Petrochemical Industries, Ltd., both of Tokyo, Japan

Filed Dec. 31, 1979, Ser. No. 108,583
Claims priority, application Japan, Jan. 6, 1979, 54-875
Int. Cl.³ C10G *9/16, 9/34*
U.S. Cl. 208—48 Q **11 Claims**



1. In a process for thermal cracking raw hydrocarbons in the

presence of steam and a fused salt to produce an olefin-containing fluid mixture, said process comprising: feeding a fused salt, steam and raw hydrocarbons into a reaction tube of a thermal cracking furnace of external heating type to thermally crack the raw hydrocarbons; passing the resulting fluid mixture comprising cracked products, fused salt and steam through a vertically disposed quenching zone having an inner wall with an inner wall surface and an outer wall, to quench the fluid mixture; separating the resulting quenched fluid mixture into a fused salt component and a gaseous component; purifying the separated fused salt component by removing sludge therefrom; recirculating the resulting purified fused salt to the reaction tube; and separating and recovering olefin-containing gas from the gaseous component, the improvement comprising:

(a) admixing steam and the purified fused salt and injecting the resulting steam-fused salt mixture into the reaction tube through a first inlet;

(b) admixing steam and raw hydrocarbons and injecting the resulting steam-raw hydrocarbon mixture into the reaction tube through a second inlet positioned downstream of the first inlet;

(c) passing the fluid mixture downward along the inner wall surface of the quenching zone while simultaneously passing purified molten salt downward along said surface to prevent the accumulation of a coke deposit in the quenching zone.

4,276,154

PROCESS FOR THE ELECTROSTATIC SEPARATION OF CRUDE POTASH SALTS

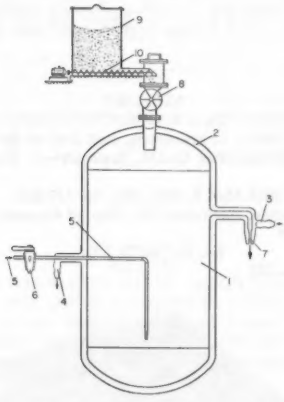
Arno Singewald, Kassel-Wilh.; Günter Fricke, Heringen; Ulrich Neitzel, Heringen, and Iring Geisler, Heringen, all of Fed. Rep. of Germany, assignors to Kali und Salz Aktiengesellschaft, Kassel, Fed. Rep. of Germany

Continuation of Ser. No. 792,334, Apr. 29, 1977, abandoned. This application Mar. 16, 1979, Ser. No. 21,278

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619026

Int. Cl.³ B03B *1/04, 1/02*

U.S. Cl. 209—3 **13 Claims**



1. A process for the electrostatic separation of a crude potash salt into the components thereof, which comprises:

grinding the crude salt to an average particle size of about 0.25 to 2 mm.;

contacting the ground crude salt with a normally liquid or solid conditioning agent which has been converted into the gaseous state, such that said gaseous conditioning agent draws up onto the surfaces of the crude salt particles by absorption, said gaseous conditioning agent being essential to the electrostatic separation;

electrically charging the salt at a relative humidity of 2-30%;

passing the conditioned charge crude salt particles through an electrostatic field to separate the crude salt into at least two fractions and to separate said conditioning agent therefrom; and

recovering a potash-enriched product fraction whereby substantially less conditioning agent is required than would otherwise be the case if a non-vaporized conditioning agent were employed.

4,276,155

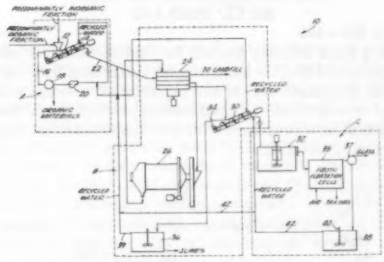
METHOD FOR RECYCLING THE WATER USED IN A PROCESS FOR RECOVERING GLASS FROM MUNICIPAL WASTE

John G. Roeschlaub, Upland, and Ivan J. Hopkins, Pomona, both of Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Nov. 7, 1977, Ser. No. 849,063

Int. Cl.³ B03B *7/00*

U.S. Cl. 209—10 **23 Claims**



1. A process for the recovery of glass from the municipal trash which has been segregated into a glass-containing organic fraction and a glass-containing inorganic fraction comprising the steps of:

(a) introducing the glass-containing organic fraction and the glass-containing inorganic fraction to a first water-based classifier, introducing water to the first classifier to entrain and separate the organic materials from the inorganic materials and leave a glass-containing inorganic mixture, discharging the water with the entrained organic materials to a first recycling means which includes first separation means to separate the entrained organic materials from the water, and thereafter recycling at least a portion of the water back to the first classifier;

(b) discharging the glass-containing inorganic mixture from the first classifier, entraining the glass-containing inorganic mixture in a stream of water, transferring the glass-containing inorganic mixture and entraining water to a second classifier to remove particles greater than a first predetermined mesh size, passing the entraining water and particles less than the predetermined mesh size to a third classifier to remove particles less than a second predetermined mesh size and recovering a size classified glass-containing inorganic mixture, discharging the entraining water and particles less than the second predetermined mesh size to a second recycling means which includes second separation to separate the water from the particles, and thereafter recycling at least a portion of the water from the second recycling means to entrain the glass-containing inorganic mixture discharged from the first classifier and transfer it to the second classifier; and,

(c) subjecting the size classified glass-containing inorganic mixture recovered from the third classifier to froth flotation in water in the presence of a beneficiating amount of a collector reagent for glass to form a water float containing predominantly glass and an essentially glass-free tailing, discharging the glass and entraining water to a third

recycling means which includes third separation means to separate the major portion of the glass from the entraining water, said entraining water from said third separation means having suspended entrained particles, and fourth separation means to separate suspended, entrained particles from the water discharged from said third separation means and thereafter recycling a portion of the water from the third recycling means for use in the froth flotation and recycling a portion of the water to any one, two or all of the first, second and third classifiers, such process being further characterized in that none of the water recycled from any individual recycling means is returned to the process at a point downstream from such recycling means.

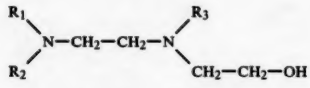
4,276,156

FROTH FLOTATION PROCESS USING CONDENSATES OF HYDROXYETHYLETHYLENEDIAMINES AS COLLECTORS FOR SILICEOUS MATERIAL

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 8, 1979, Ser. No. 92,239
Int. Cl.³ B03D *1/02*
U.S. Cl. 209—166 **5 Claims**

1. In a froth flotation process for floating siliceous matter from phosphate ore, the improvement comprising frothing the siliceous phosphate ore in the presence of a condensation product or an acid salt of a condensation product of a fatty acid or fatty acid ester condensed with (i) a compound or mixture of compounds of formula I



I

wherein R_1–R_3 are each independently hydrogen or hydroxyethyl, with the proviso that a predominant amount of the compounds of formula I bear two or three hydroxyethyl moieties, and (ii) an ethanolamine selected from the group consisting of monoethanolamine, diethanolamine and triethanolamine, said components of the condensation product having been condensed in a ratio of from about 0.3 to about 0.7 equivalent of (i) for each equivalent of fatty acid or ester and the sum of the equivalents of components (i) and (ii) in the condensation product being from about 0.9 to about 1.1 times the equivalents of fatty acid or ester, said condensation product or a salt thereof being present in the flotation medium at a loading which is not substantially greater than the loading which effects the maximum assay of phosphate in the underflow.

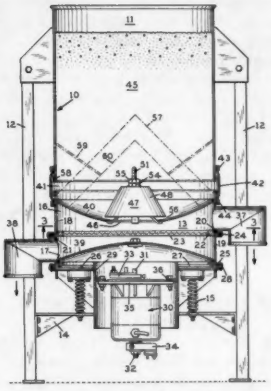
4,276,157

COMBINATION FEEDER AND SIFTER

Ehrick K. Haight, P.O. Box 326, Rowayton, Conn. 06853

Filed Jan. 28, 1980, Ser. No. 116,156
Int. Cl.³ B07B *1/28*
U.S. Cl. 209—246 **13 Claims**

1. A combined vibratory feeder and sifter, which comprises
(a) a vertically elongated supply hopper for retaining a variable, bulk supply of particulate material to be screened,
(b) said hopper having a generally open bottom structure,
(c) support means for supporting said supply hopper in generally fixed relation,
(d) a vibratory bottom structure positioned directly below and associated with said supply hopper,
(e) resilient support means for said bottom structure accommodating vibratory motion thereof relative to said supply hopper,
(f) a generally horizontal bottom-forming panel in said bottom structure effectively forming a bottom wall of said supply hopper and operative to directly support the particulate material stored in said hopper,
(g) connecting means joining the open lower end of said generally fixed supply hopper with said bottom-forming panel while accommodating vibratory motion of said bottom-forming panel relative to said supply hopper,
(h) said bottom-forming panel having a discharge opening therein,
(i) an adjustable feed rate limiting means associated with said discharge opening and operative to control the rate of flow of particulate material therethrough in response to vibratory movement of said bottom structure,



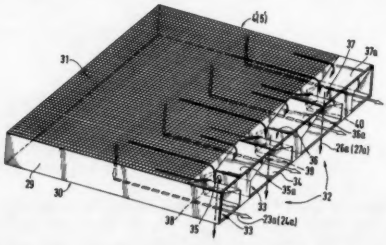
(j) said vibratory bottom structure further including a sifting screen mounted in said bottom structure directly beneath said bottom-forming panel and in position to receive particulate material passing through said discharge opening,
(k) discharge outlets for said particulate material located above and below said sifting screen, and
(l) a common vibratory drive means for said bottom structure for imparting controlled vibratory motion simultaneously to said bottom-forming panel and said sifting screen.

4,276,158

SCREEN FOR A SCREENING MACHINE

Frank Otto Görlitz, Braunschweig, Fed. Rep. of Germany, assignor to Bühler-Miag GmbH, Braunschweig, Fed. Rep. of Germany

Filed Mar. 5, 1980, Ser. No. 127,405
Claims priority, application Fed. Rep. of Germany, May 15, 1979, 2919500
Int. Cl.³ B07D *1/04*
U.S. Cl. 209—255 **8 Claims**



1. An exchangeable planar screen unit for use in a screening machine having an outlet for fine particles and an outlet for

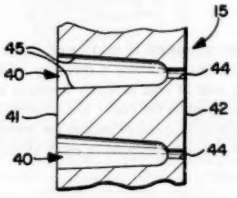
larger particles, said screen unit comprising a screen frame having an open lateral wall and a floor for collecting screened fine particles; a mesh fabric secured on said frame above said floor to act as a screening surface; duct means adjoining said fabric and said floor at said open lateral wall, said duct means including at least two separate channels crossing each other, one of said channels communicating with said floor for guiding the screened fine particles from said floor toward said outlet for larger particles, and the other channel communicating with said screening surface for separately guiding the larger particles remaining on said screening surface toward said outlet for fine particles.

4,276,159

APPARATUS FOR SCREENING PAPER FIBER STOCK

Donald F. Lehman, Middletown, Ohio, assignor to The Black Clawson Company, Middletown, Ohio

Filed Jun. 19, 1980, Ser. No. 161,100
Int. Cl.³ B07B *1/20*
U.S. Cl. 209—273 **6 Claims**



1. Screening apparatus for paper making stock comprising, a pressure housing, a cylindrical screening member dividing the interior of said housing into an inlet chamber and an accepts chamber and having multiple screening perforations therethrough, and a rotor mounted for rotation in said housing and including vane means for preventing plugging of said perforations, and further characterized by the fact that said perforations are of greater flow area on the surface of said screening member facing said inlet chamber than on the accepts side of said screening member.

4,276,160

METHOD FOR WASTE WATER PURIFICATION WITH THE AID OF A SORPTION AGENT

Dietfried Donnert, Karlsruhe; Siegfried Eberle, Eggenstein-Leopoldshafen, and Gerhard Endres, Rastatt, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Jun. 7, 1978, Ser. No. 914,905
Claims priority, application Fed. Rep. of Germany, May 5, 1978, 2726192
Int. Cl.³ B01D *15/00*
U.S. Cl. 210—660 **17 Claims**

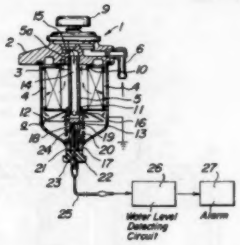
1. A method of purifying waste water by contacting the waste water with a sorption agent, comprising contacting said waste water with a sorption agent which consists essentially of Al_2O_3 which has been treated with ions which when incorporated in the crystal lattice of said Al_2O_3 are capable of delaying crystallization of the gamma phase of said Al_2O_3 or with the salts of said ions.

4,276,161

FUEL FILTER PROVIDED WITH A WATER LEVEL DETECTING MEANS

Katsuhiko Matsui, Yokohama; Yukio Kashiwaba, Omiya, and Yoshioki Kishimoto, Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 7, 1980, Ser. No. 110,348
Claims priority, application Japan, Jan. 10, 1979, 54-1747[U]
Int. Cl.³ B01D *27/10*
U.S. Cl. 210—86 **7 Claims**



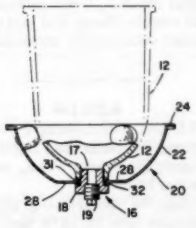
1. A fuel filter and water level detecting means comprising, in combination, a bracket having a fuel inlet and a fuel outlet, a filter casing mounted below said bracket, and a filter element arranged in said casing for filtering fuel introduced in the filter through said fuel inlet, wherein the improvement comprises a connector plug at a bottom portion of said filter casing, said plug including an electrode formed integrally therewith for water level detection, said electrode protruding to a predetermined level in the casing and being manually removable from the casing for water draining, a water level detecting circuit responsive to said electrode for detecting the level of water accumulated in the lower portion of the casing, said electrode developing an electric signal as a function of variation of conductance between the electrode and the casing, the detecting circuit having a delay response function to the input electric signal, and an alarm means responsive to an output signal of said water level detecting circuit for providing an alarm condition.

4,276,162

FLAME RESISTANT SUMP ASSEMBLY

Michael Wilson, Modesto, Calif., assignor to Racor Industries, Inc., Modesto, Calif.

Filed Jul. 14, 1980, Ser. No. 168,694
Int. Cl.³ B01D *21/00*
U.S. Cl. 210—94 **10 Claims**



1. In a fuel filter system including a chemical resistant plastic sediment bowl transparent to visible light at the lower end thereof, said sediment bowl having an aperture in the bottom thereof with a drain means mounted in said aperture, the improvement comprising a flame deflector mounted with said drain means at the bottom of said bowl and surrounding a lower portion of said bowl in spaced relation thereto; said flame deflector being made of stainless steel and having a wall

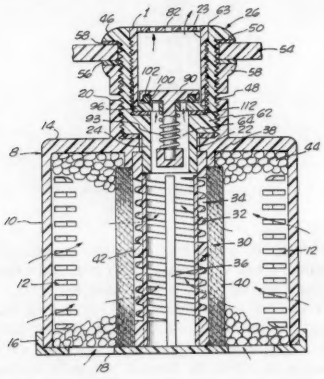
thickness between ten thousandths and fifteen thousandths of an inch with a stiffening flange about the upper edge thereof.

4,276,163

HYDROSTATIC RELIEF VALVE

Leonard Gordon, 18344 Oxnard St. Unit 108, Tarzana, Calif. 91356

Filed Nov. 13, 1979, Ser. No. 94,176
Int. Cl.³ B01D *35/02*
U.S. Cl. 210—136 **8 Claims**



1. A hydrostatic relief valve assembly for use with hot tubs, spas and the like disposed in the ground, comprising;
   a. a filter cage defining a hollow interior;
   b. a circular aperture in one end of said cage;
   c. an inwardly extending circular flange attached to said cage and located concentrically around said circular aperture;
   d. a circular neck attached to and extending above said cage, said neck located concentrically around said circular aperture;
   e. a cylindrical insert, attachable to said neck and to the tub or spa floor, having a circular insert neck with an exterior diameter less than that of said circular aperture such that said insert neck may enter said circular aperture, to provide fluid communication between said filter cage and said insert, and further having a spring loaded check valve unit in fluid communication with said insert neck;
   f. a substantially porous cylindrical collection tube having an exterior diameter approximately equal to the interior diameter of said circular flange and an interior diameter approximately equal to the exterior diameter of said insert neck, such that the end of said collection tube fits snugly between said circular flange and said insert neck; and
   g. filtration means substantially surrounding said collection tube.

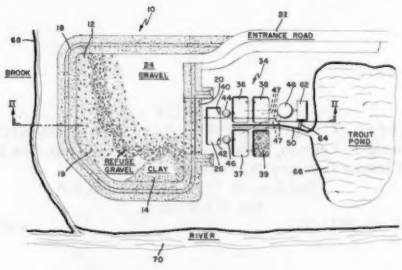
4,276,164

EFFLUENT TREATMENT SYSTEM

Leonard P. Martone, Worcester Rd., Barre, Mass. 01005, and Ronald L. Lavigne, Petersham, Mass., assignors to Leonard P. Martone, Barre, Mass.

Continuation of Ser. No. 936,824, Aug. 25, 1978, abandoned.
This application Dec. 31, 1979, Ser. No. 108,418
Int. Cl.³ C02F *9/00*
U.S. Cl. 210—170 **12 Claims**

1. System for treating leachate effluent from refuse, comprising:
   (a) a refuse basin for the reception of refuse material,
   (b) a liner of substantially water-impervious material covering the inside contours of the basin,
   (c) a water-impervious catch basin adjacent the refuse basin and located at a lower level than the refuse basin,
   (d) means forming part of said refuse basin for allowing leachate to drain from the refuse basin to the catch basin, the means for allowing leachate to drain from the refuse basin to the catch basin comprising a water-permeable dike along one side of the refuse basin in direct contact with the refuse in the basin and an extension of water-impervious materials sloping downwardly from the bottom of the dike to the catch basin,
   (e) water impervious first and secondary primary lagoons for effecting a primary treatment of refuse leachate,
   (g) primary flow control means for selectively conveying



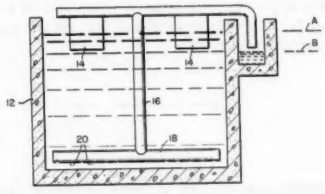
leachate accumulated in said catch basin to said first and second lagoons, whereby a quantity of leachate may be treated in one of said primary lagoons while leachate is being conveyed to the other of said primary lagoons, and
   (h) secondary flow control means for transferring leachate from each primary lagoons to each of secondary lagoons.

4,276,165

SLUDGE SIPHON COLLECTOR WITH DE-GASING HEADER

Alan D. Chamberlain, Beaver, Pa., assignor to Sybron Corporation, Rochester, N.Y.

Filed Apr. 7, 1980, Ser. No. 138,097
Int. Cl.³ B01D *21/24*
U.S. Cl. 210—242.1 **7 Claims**



1. In a siphon system for use in removing sludge from the bottom of sewage settling tank or the like including a siphon having a vertical inlet leg extending down towards the bottom of the settling tank, the lower end of the inlet leg communicating with a generally horizontal collection header having openings at spaced intervals along the lower portion thereof for drawing sludge and the like into the horizontal header and up through the inlet leg when the siphon is operating, the improvement comprising:
   (a) means associated with the upper portion of said horizontal collection header for collecting and venting gas therefrom prior to the entry of the gas into said siphon vertical inlet leg, whereby dissolved gases released from the sludge upon entry into said header is prevented from accumulating in the siphon inlet leg and destroying the prime of the siphon.

4,276,166

FILTER APPARATUS AND A METHOD OF CLEANING FILTER ELEMENTS THEREOF

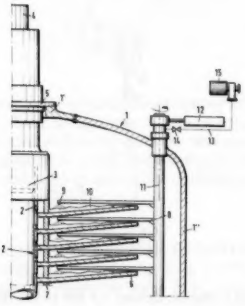
Hans Müller, Erlenbach, and Bruno Guazzone, Rapperswil, both of Switzerland, assignors to Chemap A.G., Männedorf, Switzerland

Division of Ser. No. 011,950, Feb. 13, 1979, which is a continuation of Ser. No. 899,176, Apr. 24, 1978. This application Sep. 19, 1979, Ser. No. 77,088

Claims priority, application Switzerland, May 9, 1977, 5738/77

Int. Cl.³ B01D *33/22*

U.S. Cl. 210—327 7 Claims



1. A filter apparatus, comprising an elongated shaft; a plurality of filter elements mounted on said shaft and spaced from one another in direction of elongation of said shaft, said filter elements being provided with a filtering material upon a surface of which a cake is deposited during a filtering process; means for cleaning said filter elements, including a source of a cleaning medium, which has a manifold and a plurality of conduits mounted on and communicating with said manifold and each having an end portion, a plurality of nozzle elements facing towards said surfaces of said filtering material of said filter elements, and each carried by the end portion of a respective one of said conduits, and adjustable means for elevating the pressure of said cleaning medium when the same is supplied to said nozzle elements so as to supply the medium to said nozzle elements under a desired adjustably elevated pressure, said manifold together with said conduits and said nozzle elements being turnable relative to said surfaces of said filtering material of said filter elements; means for turning said manifold together with said conduits and said nozzle elements relative to said surface of said filtering material of said filter elements; and means for rotating said filter elements about the elongated axis of said shaft during ejecting the cleaning medium towards said surfaces under a desired elevated pressure to thereby remove the cake from said surfaces and thereupon also clean the filtering material of the filter elements.

4,276,167

DIFFUSER ARRANGEMENTS

Johan C. F. C. Richter, St. Jean Cap Ferrat, France, and Ole J. Richter, Karlstad, Sweden, assignors to Kamyr Aktiebolag, Karlstad, Sweden

Filed Apr. 25, 1979, Ser. No. 34,928

Int. Cl.³ B01D *33/00*

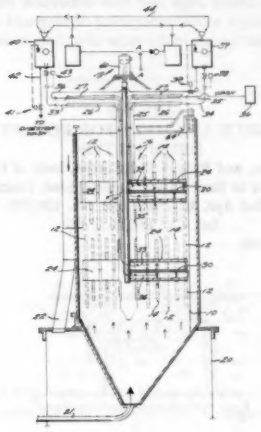
U.S. Cl. 210—331 22 Claims

1. In an elongated upright hollow vessel, which includes side and bottom walls, the combination comprising:

(a) a plurality of withdrawal screens extending substantially parallel to the vessel direction of elongation, and spaced from each other in directions perpendicular to the vessel direction of elongation;

(b) conduit means for supporting said withdrawal screens and for providing for passage of fluid from said withdrawal screens to an area remote from said withdrawal screens and exterior of said vessel;

(c) means for reciprocating said conduit means with attached withdrawal screens up and down in a direction substantially coincident with the direction of elongation of the vessel, said reciprocating means consisting essentially



of a linear actuator located within the cross-sectional area of the vessel, so that said conduit means and withdrawal screens do not penetrate the vessel side and bottom walls; and

(d) means for introducing fluent material to be treated into said vessel and withdrawing treated fluent material therefrom.

4,276,168

DEVICE FOR DEWATERING SLUDGE

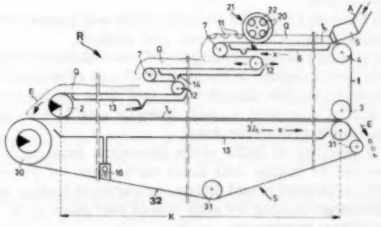
Wendel Bastgen, Betzdorf, Fed. Rep. of Germany, assignor to Alb. Klein GmbH & Co. KG, Niederfischbach, Fed. Rep. of Germany

Filed Dec. 11, 1979, Ser. No. 102,423

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1978, 2854168

Int. Cl.³ B01D *33/04*

U.S. Cl. 210—396 6 Claims



1. Apparatus for continuously dewatering a suspension comprising a driven filter band, deflection roll means supporting said band and forming an upper strand therefor, means for depositing suspension on said upper strand which serves as a filter so that a dewatered cake is formed on said upper strand, said deflection roll means including a first deflection roll on which said upper strand passes and is reversed in direction at a downstream end of said upper strand and a second deflection roll located below and downstream of said first deflection roll, said band traveling from said first roll to said second roll in

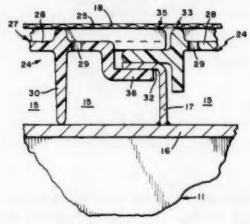
opposite direction to the direction of travel of said upper strand and then passing around said second roll to travel along an intermediate length in the same direction as said upper strand, said first deflection roll being located above said intermediate length and forming with said second deflection roll a Z-shaped step for said band such that said cake is transported by said upper strand over said first deflection roll onto said intermediate length while undergoing turning and transport on said intermediate length in the same direction as on said upper strand.

4,276,169

DRAINAGE DECK ASSEMBLY FOR ROTARY VACUUM DRUM FILTER

Paul A. Browne, and Robert W. Morton, both of Orillia, Canada, assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Apr. 10, 1980, Ser. No. 139,009
Int. Cl.³ B01D *33/06*
U.S. Cl. 210—404 **8 Claims**



1. A drainage deck assembly for a rotary vacuum drum filter having a drum mounted for rotation in an ascending and descending path into and out of a slurry tank, said drainage deck assembly comprising:

(a) a plurality of divider members extending longitudinally of the central axis of said drum and mounted in spaced and parallel relationship about the outer surface of said drum,

(b) at least one rectangular shaped drainage grid section mounted between each pair of divider members to provide filtrate compartments therebetween about the circumference of said drum,

(c) openings provided in the outer surface of said drum in each of said filtrate compartments for receiving filtrate for discharge from said filter,

(d) interlocking means on the trailing and leading ends of each grid section for securing said grid section to said pair of dividers,

(e) a filter media located about the drum and spaced from the outer surface thereof by said grid sections,

(f) a plurality of spaced and parallel rows of filtrate receptacle trays provided in the surface of each of said grid sections to receive filtrate from said filter media when a vacuum is applied to said drainage grid section in the ascending path of the drum,

(g) a plurality of baffle walls depending from each grid section to engage said drum surface and to provide a filtrate channel in said filtrate compartment leading to said discharge opening for each row of said plurality of rows of filtrate receptacles,

(h) said filtrate receptacle trays each having a bottom wall surface spaced from said filter media by the sidewalls of the tray, and

(i) a filtrate discharge slot formed in the bottom wall of each of said filtrate trays at a predetermined location at the end of said tray closest to the trailing end of the grid section to permit flow of filtrate into its associated filtrate channel in said filtrate compartment during the ascending path of said drum and to prevent flowback of filtrate through said slot when said vacuum is interrupted in the descending path of the drum.

4,276,170

VENTED FLEXIBLE FILTRATION DEVICE FOR USE IN ADMINISTERING PARENTERAL LIQUIDS

Vincent L. Vaillancourt, Livingston, N.J., assignor to Critikon, Inc., Tampa, Fla.

Continuation-in-part of Ser. No. 934,107, Aug. 16, 1978, abandoned, which is a continuation of Ser. No. 814,372, Jul. 8, 1977, abandoned, which is a continuation-in-part of Ser. No. 736,670, Oct. 28, 1976, Pat. No. 4,066,556. This application Mar. 26, 1979, Ser. No. 23,873
The portion of the term of this patent subsequent to Jan. 3, 1995, has been disclaimed.
Int. Cl.³ B01D *19/00*
U.S. Cl. 210—436 **10 Claims**

1. A vented filtration device for use in the filtration of parenteral liquids comprising: a closed, flexible and compressible housing having a liquid inlet and a liquid outlet, said housing including an internal passage connecting said inlet and outlet; a filter assembly disposed within said passage between said inlet and said outlet thereby defining an upstream pressure section between said inlet and said assembly and a downstream pressure section between said assembly and said outlet, said filter assembly including a flexible porous, bacteria retentive filter membrane having a pore size not greater than 0.22 microns, a flexible, porous support material having pores generally greater in size than those of said filter membrane overlying one surface of said filter membrane, and a flexible frame overlying the surface of said filter membrane opposite said supported surface, said frame having at least one central opening exposing a substantial surface area of said filter membrane, said filter assembly adapted to filter all liquid passing from said inlet to said outlet during use; said filter assembly including at least one fold to form said filter membrane into a pouch having an open end facing toward said downstream pressure section and having a closed end facing said upstream pressure section; and gas vent means through said housing communicating with said upstream pressure section of said passage adapted to allow gas but not liquid to pass from said upstream section out of said housing whereby gas entering said upstream section will not clog said filter membrane, said filter assembly providing a sufficiently low pressure drop thereacross, so as to eliminate the requirement of a pump to force said fluid through said assembly and said assembly capable of being deformed and still maintain fluid flow without the requirement of a pump to force said fluid through said assembly.

4,276,171

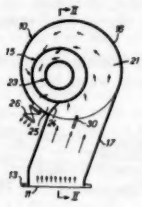
WATER FILTER HAVING SPIRAL CASING

Philip Jackson, Paris, France, assignor to E. Beaudrey & Cie, Paris, France

Filed Jun. 15, 1977, Ser. No. 806,929
Claims priority, application France, Jun. 22, 1976, 76 18883
Int. Cl.³ B01D *29/04*
U.S. Cl. 210—437 **5 Claims**

1. A self-cleaning filter for filtering solids entrained in water for industrial use, comprising a housing having inlet means and outlet means and a strainer or filter member disposed operatively therebetween said housing being of spiral configuratin so

as to define a water flow pattern sweeping along the periphery of said strainer or filter member and wall means remote from said inlet means relative to the direction of flow of water defined by said spiral housing and fitted between said spiral housing and said strainer or filter member for preventing solids



from circulating entirely around the periphery of said strainer or filter member back to said inlet means, a solids collecting area upstream of said wall means between said strainer or filter member and said spiral housing, and discharge means for discharging solids collected in said solids collecting area.

4,276,172

CELLULOSIC MEMBRANE FOR BLOOD DIALYSIS

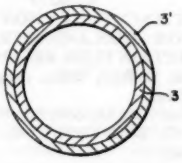
Werner Henne, and Gustav Dünweg, both of Wuppertal, Fed. Rep. of Germany, assignors to Akzo N.V., Arnhem, Netherlands

Filed Feb. 7, 1978, Ser. No. 875,926

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1977, 2705733; Feb. 11, 1977, 2705735

Int. Cl.³ B01D *31/00, 13/00*

U.S. Cl. 210—490 **17 Claims**



1. A dialyzing membrane for blood dialysis consisting essentially of a cuprammonium regenerated cellulose having a total membrane thickness of about 5 to 100 μm with at least two layers which have been separately extruded and then immediately joined together in side by side relationship for coagulation in a precipitation bath and for permanent adherence of the layers to each other, each layer thereby being formed as a seal against the penetration of blood through the leakage points of an adjacent adhered layer.

4,276,173

CELLULOSE ACETATE HOLLOW FIBER AND METHOD FOR MAKING SAME

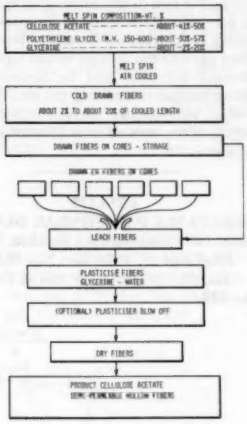
Michael J. Kell, Concord, and Robert D. Mahoney, Dublin, both of Calif., assignors to Cordis Dow Corp., Miami, Fla.

Continuation-in-part of Ser. No. 812,929, Jul. 5, 1977, abandoned. This application Dec. 21, 1978, Ser. No. 972,090

Int. Cl.³ B01D *39/16, 13/00*

U.S. Cl. 210—500.2 **8 Claims**

1. A cellulose acetate hollow fiber having an internal diameter in the range of about 100 to about 350 microns and a wall thickness in the range of about 20 to about 60 microns, said wall having a selective permeability when used in hemodialysis for water and solutes to be removed from blood represented by an ultrafiltration coefficient K_{UFR} in the range of about 2 to about 6 milliliters per hour per square meter per millimeter of mercury and a urea coefficient K_{UREA} in the range of about 15×10^{-3} to about 45×10^{-3} centimeters per minute, said fiber characterized by the concurrent capability of separating urea



from blood and water from blood at rates represented by a minimum ratio of the coefficients K_{UREA}/K_{UFR} of 3 to 1×10^{-3}.

4,276,174

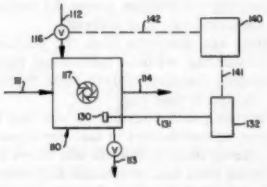
CONTROL OF SLUDGE TEMPERATURE IN AUTOTHERMAL SLUDGE DIGESTION

Edmund J. Breider, Getzville, and Raymond F. Drnevich, Clarence Center, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 26, 1980, Ser. No. 129,292

Int. Cl.³ C02F *11/04*

U.S. Cl. 210—613 **9 Claims**



1. In a process for controlling the autothermal aerobic digestion of sludge, wherein the sludge is mixed with an oxygen-containing gas in the presence of aerobic micro-organisms in a covered digestion zone to thereby form an aerated mixed liquor which is retained in said digestion zone for sufficient time to partially stabilize the sludge, the improvement comprising:

(a) maintaining total volatile solids content of the sludge above at least 20,000 mg/l;

(b) maintaining total volatile solids content of the aerated mixed liquor above at least (100−X)% of the total volatile solids content of the slude, wherein X=60 times the ratio of the biodegradable volatile solids content of the sludge to the total volatile solids content of the sludge;

(c) introducing said oxygen-containing gas into said covered digestion zone for said mixing therein at an oxygen concentration of at least 20% oxygen (by volume) with said mixing and the rate and quantity of the introduction of oxygen-containing gas being maintained at sufficient levels to dissolve at least 0.03 pounds of oxygen per pound of

total volatile solids content in the sludge introduced into said covered digestion zone;

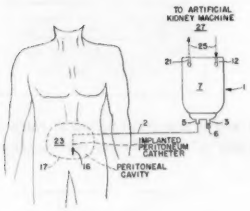
(d) sensing temperature of the aerated mixed liquor; and

(e) controlling the rate of introducing oxygen-containing gas into the aerated mixed liquor in response to the temperature sensing, by increasing the rate of introducing oxygen-containing gas into the aerated mixed liquor when temperature thereof decreases and by decreasing the rate of introducing oxygen-containing gas into the aerated mixed liquor when temperature thereof increases, to maintain temperature of the aerated mixed liquor within a predetermined range.

4,276,175
REGENERATABLE PERITONEAL DIALYSIS BAG

John D. Bower, 140 Chippewa Cir., Jackson, Miss. 39211

Filed Jul. 19, 1979, Ser. No. 58,931
Int. Cl.³ B01D *13/00;* **A61M** *1/03*
U.S. Cl. 210—636 **7 Claims**



5. A method for continuous removal of toxic metabolites from the blood by peritoneal dialysis, in which a single connection is made from a patient's peritoneal catheter to a dialysis bag for a series of successive dialysis exchanges, comprising the steps of:

(a) infusing of peritoneal dialysate from a regeneratable ambulatory dialysis bag having flexible sidewalls into the peritoneal cavity,

(b) exchanging metabolities across the peritoneal membrane from the blood into said dialysate,

(c) draining said dialysate from the peritoneal cavity into said dialysis bag, without mechanical pumping,

(d) circulating make-up dialysis fluid through said hollow fibers located in said bag,

(e) regenerating said dialysate in said bag by hollow fiber exchange of metabolites in said peritoneal dialysate with said make-up dialysis fluid in said fibers without removal of proteins from said peritoneal dialysate,

(f) reinfusing the cleansed peritoneal dialysate from said bag into the peritoneal cavity for continued peritoneal dialysis, and

(g) rolling up the emptied dialysis bag for carrying by the peritoneal dialysis patient until the next regeneration, while said bag remains attached to the peritoneal catheter of said patient.

4,276,176
WATER PURIFICATION SYSTEM

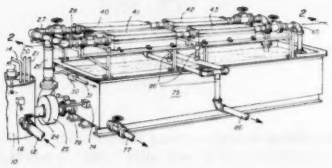
Jacob Shorr, Lexington, Mass., assignor to Systems Engineering & Manufacturing Corp., Stoughton, Mass.

Continuation of Ser. No. 703,626, Jul. 8, 1976, abandoned, which is a continuation-in-part of Ser. No. 610,688, Sep. 5, 1975, Pat. No. 4,014,787, which is a continuation-in-part of Ser. No. 429,510, Feb. 2, 1974, abandoned. This application Jun. 19, 1979, Ser. No. 49,926
Int. Cl.³ B01D *13/00, 31/00*
U.S. Cl. 210—637 **11 Claims**

3. A method of purifying water comprising,

combining at least 1700 ppm of a combining agent with wastewater at a pH of from 7.1 to 14 with the molar ratio of said combining agent to the impurities in said wastewater being 1:1 or greater so that a particle-water blend is formed wherein said impurities are bound with said combining agent in particles of size at least 10 angstroms; said combining agent comprising an inorganic metal hydroxide with the metal being selected from the group consisting essentially of iron, aluminum, tin, copper, zinc, cadmium, nickel, cobalt, silicon, lead, barium, calcium, manganese, and chrome,

and subsequently filtering said particle-water blend by passing said particle water blend to a plurality of parallel



conduits each containing a plurality of series arranged ultrafiltration units whereby a portion of said water from said water particle blend is withdrawn through said ultrafiltration units with a slurry being passed to a recirculation tank for recirculation through said ultrafiltration units,

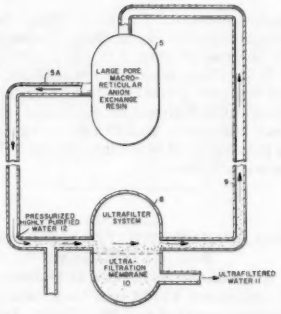
each of said ultrafiltration units comprising a plurality of filter tubes each having an inner surface covered by an ultrafiltration membrane,

and means for selectively directing flow through the membranes of one or more of said ultrafiltration units directly to said recirculation tank while permitting withdrawal of purified water from other of said ultrafiltration units.

4,276,177
HIGH EFFICIENCY FILTRATION WITH IMPURITY CONCENTRATION AND ULTRAFILTRATION REJECTION FLOW RECIRCULATION

Verity C. Smith, Dedham, Mass., assignor to Vaponics Inc., Plymouth, Mass.

Filed Aug. 13, 1979, Ser. No. 66,049
Int. Cl.³ B01D *13/00, 15/04;* **B01J** *4/04*
U.S. Cl. 210—638 **6 Claims**



1. A process for the purification of water comprising:

(a) providing a flow of raw water to be purified;

(b) pretreating said raw water flow for partial purification;

(c) introducing the flow of raw water exiting the pretreatment in (b) into an ultrafilter to produce a flow of purified water and a rejection flow exiting the ultrafilter;

(d) passing only said rejection flow through a large-pore macroreticular anion exchange resin to remove contaminants from said reject flow;

(e) combining the rejection flow from step (d) with the raw

water introduced into the ultrafilter in step (c) to form a circulating loop.

4,276,178

APPARATUS FOR PURIFICATION OF WASTE WATER BY MEANS OF ACTIVE CARBON

Günther Gappa, Gelsenkirchen-Buer; Harald Jüntgen, and Jürgen Klein, both of Essen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

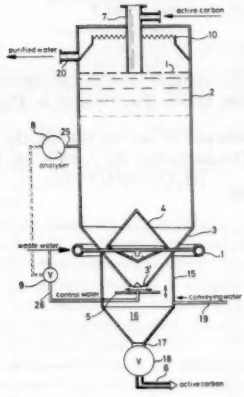
Continuation of Ser. No. 602,000, Aug. 5, 1975, Pat. No. 4,202,770. This application Jun. 7, 1979, Ser. No. 46,500

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1974, 2437745

The portion of the term of this patent subsequent to May 13, 1997, has been disclaimed.

Int. Cl.³ B01D *15/02*

U.S. Cl. 210—662 **6 Claims**



1. A method of purifying contaminated fluids in an upright vessel, comprising the steps of continuously admitting a flow of particulate purifying material into an upper end portion of the vessel, for downward movement therein; continuously admitting a flow of contaminated fluid into a confined space located in a lower end portion of the vessel and bounded in part by an upwardly tapering conical upper wall a generatrix of which includes with a horizontal line an angle of 45°–55°; continuously discharging the contaminated fluid from the confined space through a plurality of closely adjacent substantially uniformly arranged apertures in the upper wall, in form of individual upwardly flowing streams which are distributed over the entire cross-sectional area of the lower vessel end portion so that a purification front develops at which the downwardly moving particulate material is laden over the entire vessel cross-section with inpurities removed from the upwardly moving contaminated fluid; and maintaining the location of the purification front substantially steady relative to the downwardly moving particulate material and to the vessel at a preselected level of the vessel.

4,276,179

REMOVING HALOGENATED HYDROCARBONS FROM AQUEOUS MEDIA BY UTILIZING A POLYOLEFINIC MICROPOROUS ADSORBENT

John W. Soehngen, Berkeley Heights, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Jun. 1, 1979, Ser. No. 44,803

Int. Cl.³ B01D *15/00*

U.S. Cl. 210—679 **17 Claims**

1. A process for removing non-polymeric halogenated hydrocarbons and molecular and elemental halogens selected from at least one member of the group consisting of chlorine, fluorine, bromine, and iodine, from an aqueous medium which comprises contacting said aqueous medium with a polyolefinic microporous adsorbent having a surface area of from about 10 to about 40 square meters per gram of adsorbent selected from at least one member of the group of films, fibers, yarn, sheets, fabrics and laminates, said polyolefinic adsorbent comprising an olefinic polymer selected from the group consisting of ethylene homopolymers, propylene homopolymers, poly-3-methylbutene-1, poly-4-methylpentene-1, copolymers thereof, and copolymers thereof with a minor amount of a straight chain n-alkene.

4,276,180

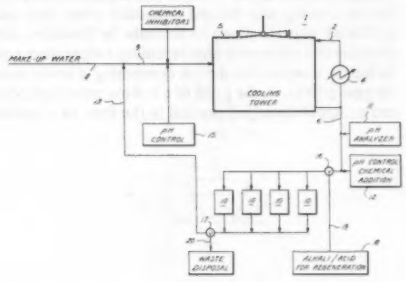
INDUSTRIAL WASTE-WATER REUSE BY SELECTIVE SILICA REMOVAL OVER ACTIVATED ALUMINA

Jack V. Matson, 10919 Braes Forest, Houston, Tex. 77071

Filed Nov. 30, 1979, Ser. No. 98,911

Int. Cl.³ C02F *1/60, 5/08*

U.S. Cl. 210—683 **10 Claims**



1. A method for maintaining silica content in a recirculating cooling water system containing water conditioning chemicals selected from the group consisting of sulfates, phosphonates and chromates below a level at which silica scale formation occurs without discharging blowdown from the system with consequential elimination from the system of said water conditioning chemicals or resulting pollution of the environment, comprising the steps of:

(a) continuously diverting a portion of the chemically conditioned cooling water from said cooling water system as a side stream;

(b) contacting said side stream with activated alumina while said side stream has a pH value of from about 7.0 to about 9.0 to selectively remove silica from said water while leaving the chemical conditioning of the water undisturbed; and

(c) then returning said chemically conditioned side stream of reduced silica content to the cooling water system.

4,276,181

PROCESS AND APPARATUS FOR SEPARATION BY COALESCENCE OF EMULSIONS

Michel Cordier, La-Celle-Saint-Cloud; Herve Labaquere, Le Pecq, and Gilbert Saint-Dizier, Nanterre, all of France, assignors to Degremont, Hauts de Seine, France

Continuation of Ser. No. 890,664, Mar. 27, 1978, abandoned. This application Oct. 30, 1979, Ser. No. 89,750

Claims priority, application France, Mar. 28, 1977, 77 09140

Int. Cl.³ B01D *17/04*

U.S. Cl. 210—741 **20 Claims**

1. A process for treating organic emulsions including separating by coalescence the disperse phase from the dispersion phase of the emulsion, said process comprising:

providing within a single enclosed chamber a lower destabilizing area, a central filtering and coalescence area con-

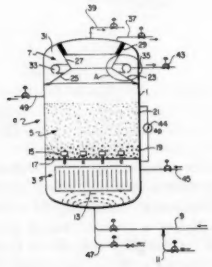
taining therein coalescence material, and an upper flotation and separation area;

conducting a coalescence treatment operation comprising:

introducing an emulsion to be treated into said lower destabilizing area and therein imparting turbulence to said emulsion and destabilizing all of said emulsion to form a destabilized emulsion while imparting a laminar and uniform upward flow to said destabilized emulsion;

passing all of said destabilized emulsion upwardly into said filtering and coalescence area and therein causing the disperse phase of said emulsion to be attracted to said coalescence material in the form of droplets, and continuing to pass all of said emulsion upwardly through said filtering and coalescence area such that said droplets of disperse phase grow in size by coalescene during such upward passage, said coalescene material filtering out matter in suspension from said emulsion during such upward passage, to thereby form a filtered and coalesced emulsion including a filtered dispersion phase and coalesced droplets of said disperse phase;

passing all of said filtered and coalesced emulsion upwardly into said upper flotation and separation area and therein causing said filtered dispersion phase and said coalesced disperse phase to separate by flotation, said flotation and separation area including a separation area including a separation device comprising a lower convergent portion in the form of a hollow truncated cone and an upper divergent portion in the form of a hollow



truncated cone, said filtered and coalesced emulsion passing upwardly through said separation device, and said coalesced disperse phase separating from and floating on top of said filtered dispersion phase within said upper divergent portion; and

separately withdrawing from said chamber the thus separated filtered dispersion phase and coalesced disperse phase;

determining the pressure difference between the lower and upper sides of said coalescence material as an indication of the degree of retention of said matter in suspension within said coalescence material; and

terminating said coalescence treatment operation and commencing a coalescence material washing operation upon the determination of a predetermined pressure difference representative of clogging of said coalescence material, said washing operation comprising:

injecting a washing liquid and a gas into said destabilizing area and then upwardly through said coalescence material in said filtering and coalescence area;

thereafter injecting a washing liquid only, as a rinsing liquid, into said destabilizing area and then upwardly through said coalescence material;

thereby removing matter insuspension from said coalescence material; and

withdrawing said washing liquid, with said removed matter in suspension, from said chamber at a position above the upper level of said coalescence material but below the level of entrance into said upper flotation and separation area.

4,276,182

HIGH TEMPERATURE CEMENT MUD SPACER

Robert M. Beirute, Fort Worth, Tex., assignor to The Western Company of North America, Fort Worth, Tex.

Division of Ser. No. 907,568, May 19, 1978, Pat. No. 4,190,110. This application May 29, 1979, Ser. No. 42,898

Int. Cl.³ E21B *33/16*

U.S. Cl. 252—8.55 R **15 Claims**

1. A spacer composition compatible with oil base drilling fluids, water base drilling fluids, well cement compositions and mixtures thereof, comprising an aqueous suspension of an effective amount of attapulgite clay and a zinc containing stabilizing compound present in an amount sufficient to stabilize said suspension at temperatures of at least about 500° F., said zinc containing stabilizing compound selected from the group consisting of zinc oxide and zinc carbonate, said suspension having a pH of at least about 7.

4,276,183

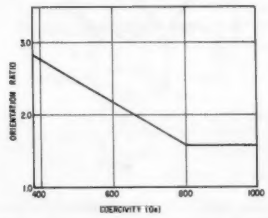
COBALT MODIFIED MAGNETIC IRON OXIDE

David M. Wilson, Easton, Pa., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 954,498, Oct. 25, 1978, abandoned. This application Jul. 2, 1979, Ser. No. 54,393

Int. Cl.³ C01G *49/02*

U.S. Cl. 428—480 **4 Claims**



1. Magnetic particles comprising magnetic iron oxide having an FeO content of from about 1 to 4 weight % and modified with at least about 0.5 weight % cobalt, both percentages being based on the weight of total product;

said particles, in a magnetic recording member at a loading of 75 weight %, providing an orientation ratio and coercivity equal to or above coordinate values on the two line segments in the FIGURE herein which meet at a coercivity of 800 and an orientation ratio of 1.6;

said recording member being formed by incorporating said particles into the formulation of Table 1 herein, coating said formulation onto polyethylene terephthalate, magnetically orienting said particles therein and thereafter drying said formulation;

said orientation ratio being determined by placing a quarter-inch disc cut from said member in a vibrating sample magnetometer with the applied magnetic field parallel to the alignment of said particles, magnetically saturating said disc at 9 kOe, and reducing said field to zero to obtain parallel saturation remanent flux density (Br ||) rotating said disc so that said applied field is perpendicular to said particles and repeating said magnetic saturation and field reduction steps, to obtain perpendicular saturation remanent flux density (Br ⊥); and dividing Br || by Br ⊥;

and said coercivity being determined by magnetically saturating said disc at 9 kOe with said applied magnetic field parallel to the alignment of said particles and measuring the value of said field at which the remanence is zero.

4,276,184
DIELECTRIC FLUIDS COMPRISING NON-HALOGENATED MIXTURES OF ORGANIC ESTERS AND AROMATIC COMPOUNDS

Lyon Mandelcorn, Pittsburgh; Thomas W. Dakin, and Robert L. Miller, both of Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 502,127, Aug. 30, 1974, abandoned, which is a continuation of Ser. No. 272,995, Jul. 18, 1972, abandoned. This application Mar. 30, 1976, Ser. No. 671,854

Int. Cl.[3] H01B *3/22, 3/20*

U.S. Cl. 252—579 7 Claims

1. A dielectric fluid comprising about 20 to about 95% diisononyl phthalate and about 5 to about 80% of a non-halogenated aromatic compound selected from the group consisting of hydrocarbons, ethers, and mixtures thereof, which is soluble in diisononyl phthalate, has 2 rings, has a boiling point over 140° C., and has a dissipation factor of less than about 10% at 100° C.

4,276,185
METHODS AND COMPOSITIONS FOR REMOVING DEPOSITS CONTAINING IRON SULFIDE FROM SURFACES COMPRISING BASIC AQUEOUS SOLUTIONS OF PARTICULAR CHELATING AGENTS

Larry D. Martin, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Feb. 4, 1980, Ser. No. 118,346

Int. Cl.[3] C23G *1/14, 1/18;* C11D *7/32, 7/26*

U.S. Cl. 252—87 47 Claims

1. A method for dissolving iron sulfide deposits with minimal hydrogen sulfide evolution comprising contacting said iron sulfide with a basic aqueous solution of a chelating agent selected from the group consisting of citric acid, oxalic acid, nitrilotriacetic acid, alkylenepolyamine polyacetic acids and mixtures of said chelating agents, said solution having a pH in the range of from about 8 to about 10.

15. An emulsified composition for dissolving deposits containing organic materials and iron sulfide with minimal hydrogen sulfide evolution comprising:

a basic aqueous solution of a chelating agent selected from the group consisting of citric acid, oxalic acid, nitrilotriacetic acid, alkylenepolyamine polyacetic acids and mixtures of said chelating agents, said solution having a pH in the range of from about 8 to about 10;

a liquid hydrocarbon solvent for said organic materials; and

an emulsifier selected from the group consisting of oxyalkylated phenols and the carboxylate salts thereof, and castor oil ethoxylated with forty moles of ethylene oxide.

4,276,186
CLEANING COMPOSITION AND USE THEREOF

Peter Bakos, Endicott; Gerald A. Bendz, Vestal; Russell E. Darrow, Newark Valley, and Dennis L. Rivenburgh, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 26, 1979, Ser. No. 52,160

Int. Cl.[3] C11D *7/32*

U.S. Cl. 252—158 21 Claims

1. A cleaning composition capable of removing at least a flux or flux residue from a ceramic substrate selected from the group consisting of aluminum oxides, silicon oxides, and aluminum silicate which consists essentially of at least about 50% by weight of N-methyl-2-pyrrolidone and at least about 5% by weight of a water miscible alkanolamine, and 0 to about 35% by weight of a solvent selected from the group consisting of hydrocarbon solvents, chlorinated hydrocarbons, fluorinated hydrocarbons, and mixtures thereof, and wherein the alkanolamine is miscible with said N-methyl-2-pyrrolidone and is a monoamine, wherein the alkanol group contains 1-4 carbon atoms.

4,276,187
OXIDATION-REDUCTION REAGENTS FOR A WET DESULFURIZATION PROCESS AND A PROCESS FOR PREPARING SAME

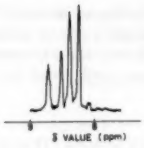
Katsuya Sakai, Yokohama; Ryuichi Mita; Toshio Kato, both of Kawasaki; Chojiro Higuchi, Kamakura, and Hisamichi Murakami, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals Incorporated, Tokyo, Japan

Filed Apr. 4, 1979, Ser. No. 26,934

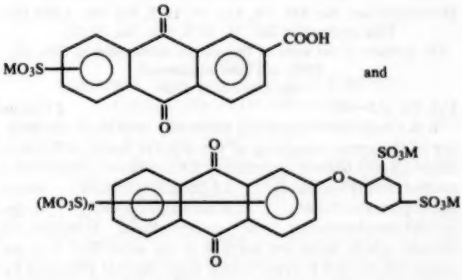
Claims priority, application Japan, May 19, 1978, 53-58878

Int. Cl.[3] C01B *17/02;* C07C *143/42;* A01N *1/00*

U.S. Cl. 252—186 4 Claims



1. A composition containing an oxidation-reduction reagent for a wet desulfurization process, which comprises: (a) an alkaline aqueous solution of at least about 0.1% of one or more compounds selected from the group consisting of salts of substituted anthraquinonesulfonic acids of the general formulae



wherein M stands for a sodium atom, a potassium atom or an ammonium group and n is an integer of 1 or 2; (b) sodium metavanadate of 1/1000–1/20 mol per liter of said aqueous solution; and (c) a sufficient amount of sodium carbonate to make the pH value of said aqueous solution range from 8.5 to 9.5.

4,276,188
PROCESS FOR MANUFACTURING 2-STILBENYL-1,2,3-TRIAZOLES AND NEW 2-STILBENYL-1,2,3-TRIAZOLES

Hans R. Meyer, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

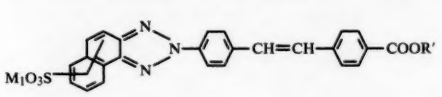
Continuation of Ser. No. 860,819, Dec. 15, 1977, abandoned, which is a continuation of Ser. No. 749,193, Dec. 9, 1976, abandoned, which is a continuation of Ser. No. 585,542, Jun. 10, 1975, abandoned. This application Aug. 1, 1979, Ser. No. 62,822

Claims priority, application Switzerland, Jun. 12, 1974, 8031/74; Jun. 12, 1974, 8032/74

Int. Cl.³ C07D *249/24*

U.S. Cl. 252—301.22 **4 Claims**

1. A 2-stilbenyl-1,2,3-triazole of the formula



wherein R′ denotes hydrogen, an alkali metal ion, alkaline earth metal ion, ammonium ion or amine salt ion or alkyl having 1 to 4 carbon atoms, and M_1 denotes a hydrogen ion, alkali metal ion, alkaline earth metal ion, ammonium ion or amine salt ion.

4,276,189
STABILIZATION OF DIBROMOSTYRENE

Philip F. Jackisch, Royal Oak, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 13, 1980, Ser. No. 130,187

Int. Cl.³ C09K *15/08, 15/32*

U.S. Cl. 252—404 **14 Claims**

11. A dibromostyrene stabilized by admixture therewith of a polymerization inhibiting amount of an oxide selected from magnesium oxide, calcium oxide, and zinc oxide.

12. A dibromostyrene stabilizing composition comprising magnesium oxide and 4-tert-butyl catechol or 2,5-dihydroxy-p-benzoquinone.

4,276,190
PROCESS FOR MONITORING TIME-TEMPERATURE HISTORIES OF PERISHABLES UTILIZING INACTIVE FORM OF DIACETYLENE

Gordhanbhai N. Patel, Morris Plains, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 938,174, Aug. 30, 1978, Pat. No. 4,208,186. This application Jul. 26, 1979, Ser. No. 60,936

The portion of the term of this patent subsequent to Feb. 19, 1999, has been disclaimed.

Int. Cl.³ C09K *3/00*

U.S. Cl. 252—408 **2 Claims**

1. A composition consisting essentially of at least one member of the group consisting of the inactive forms of 2,4-hexadiyn-1,6-diol bis(m-tolyurethane), 2,4-hexadiyn-1,6-diol bis(o-methoxyphenylurethane), 2,4-hexadiyn-1,6-diol bis(o-chlorophenylurethane), 2,4-hexadiyn-1,6-diol bis-(p-chlorophenylurethane) and co-crystallized compositions thereof, which forms are inactive in the sense that they are unreactive toward polymerization upon thermal annealing by heating below the respective melting points for several hours, and remain colorless after such heating, but which can be transformed into an active form, capable of undergoing solid state polymerization upon thermal annealing, by contacting with vapor consisting essentially of at least one member of the group consisting of p-dioxane, dimethylformamide, and pyridine.

4,276,191
CATALYST AND PROCESS FOR POLYMERIZATION OF ALPHA-OLEFINS

Nicholas M. Karayannis; Harold Grams, both of Naperville, and John S. Skryantz, Lisle, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 4, 1979, Ser. No. 45,110

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 C **6 Claims**

1. An alpha-olefin polymerization catalyst comprising

(a) at least one organoaluminum component of the formula AlR_gX_{3-g} wherein R is an alkyl radical of 1 to about 20 carbon atoms, X is halogen, and g ranges from 1 to 3, and

(b) at least one component which is the solid reaction product of components consisting essentially of (1) at least one titanium(IV) halide or alkoxyhalide, and (2) at least one hydrocarbon-soluble organomagnesium-organoaluminum complex of the formula $(MgR^1_2)_m.(AlR^2_3)_n$ wherein each R^1 and R^2 is independently an alkyl radical of 1 to about 20 carbon atoms, m and n are numbers greater than 0, and m/n is at least about 1, said components (1) and (2) being reacted at a temperature ranging from about −50° to about 150° C. and in amounts such that the atomic ratio of magnesium plus aluminum in (2) to titanium in (1) ranges from about 0.5:1 to about 4:1 to form a solid reaction product followed by separation of unreacted starting materials from said solid reaction product.

4,276,192
POLYMERIZATION CATALYSTS

Charles M. Selman, and Lawrence M. Fodor, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 6, 1979, Ser. No. 55,426

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B **19 Claims**

1. A process comprising contacting

(a) magnesium metal,

(b) an organic halide of the formula R′X or R″X_2 where X represents a halogen, R′ is selected from alkynyl, alkenyl, alkyl, aryl, cycloalkenyl or cycloalkyl radicals and combinations thereof containing from 1 to 12 carbon atoms per molecule and R″ is a saturated divalent aliphatic hydrocarbyl radical and

(c) a titanium tetrahalide and subjecting same to intensive milling in the presence of

(d) a triaryl phosphite

(e) an anhydrous aluminum trihalide and

(f) magnesium oxide but in the absence of a complexing or extraneous diluent;

thereafter activating the thus produced titanium catalyst component by contacting same with

(g) an activator comprising a trialkylaluminum compound, a dialkylaluminum chloride, and a polar organic adjuvant which is an electron donor, said adjuvant further being characterized as a 1 to 4 carbon atom alkyl ester of a substituted or unsubstituted benzoic acid.

4,276,193
CATALYST ON A SOLID CARRIER FOR THE POLYMERIZATION OF α-OLEFINS

Klaus-Peter Arlt; Ulrich Grigo, and Rudolf Binsack, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 4, 1979, Ser. No. 72,085

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1978, 2839136

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B **7 Claims**

1. A process for preparing a stereospecific α-olefin polymerization catalyst, said process consisting of the steps of

(a) forming a solid carrier of anhydrous magnesium dihalide;

(b) mixing said carrier with an electron donor compound;
(c) contacting the mixture of (b) with a solution of $TiCl_4$ in $SiCl_4$, the molar ratio of $TiCl_4$ to electron donor being from 1:10 to 1:30 and
(d) reducing the $TiCl_4$ with a reducing agent of the formula

$$AlR_nX_{3-n}$$

wherein R is alkyl having 1 to 18 carbon atoms, X is halogen and n is an integer such that $0<n\leqq 3$.

4,276,194
CATALYTIC COMPOSITE, METHOD OF MANUFACTURE, AND PROCESS FOR USE
David H. J. Carlson, Park Ridge, Ill., assignor to UOP Inc., Des Plaines, Ill.
Filed Oct. 1, 1979, Ser. No. 80,638
Int. Cl.³ B01J *31/22*
U.S. Cl. 252—430 **10 Claims**

1. A method of manufacture of a catalytic composite which comprises the following sequence of preparative steps: (1) contacting a solid adsorptive support with a substituted ammonium compound represented by the structural formula

wherein r is a hydrocarbon radical containing up to about 20 carbon atoms and selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl and aralkyl, R′ is a substantially straight-chain alkyl radical containing from about 5 to about 20 carbon atoms, and X is an anion selected from the group consisting of halide, nitrate, sulfate, phosphate, acetate, citrate and tartrate (2) drying the resulting composite prior to step (3), and thereafter, (3) contacting the resulting composite with a metal phthalocyanine and an alkali metal hydroxide, said alkali metal hydroxide being present in a weight ratio with said adsorptive support of from about 0.1:1 to about 1:1, and (4) thereafter again drying said resulting catalytic composite.

4,276,195
CONVERTING HOMOGENEOUS TO HETEROGENEOUS CATALYSTS
John G. Verkade, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa
Filed Dec. 20, 1979, Ser. No. 105,942
Int. Cl.³ B01J *31/12, 31/02*
U.S. Cl. 252—431 P **14 Claims**

1. A method of converting transition metal complex catalysts, which are homogeneous with respect to the reactants for the reaction to be catalyzed, to heterogeneous phase polymerized catalysts of substantially equal catalytic activity as said homogeneous catalysts, said method comprising:
reacting said transition metal complex with a metal bridging ligand which substantially mimics the ligand moiety of said metal complex and which has more than one ligating center;
to provide a polymerized heterogeneous transition metal complex catalyst.

4,276,196
ATTRITION RESISTANT CATALYSTS
Charles A. Dalton, and William E. Slinkard, both of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.
Filed Aug. 9, 1979, Ser. No. 65,256
Int. Cl.³ B01J *27/14, 29/00*
U.S. Cl. 252—435 **8 Claims**

1. A catalyst for the oxidative conversion of olefinically unsaturated hydrocarbons to the corresponding unsaturated aldehydes having improved attrition resistance prepared by the steps comprising:
(1) wetting an essentially inert porous support capable of holding finely divided catalytically active oxide material on its outer surface with a sufficient amount of aqueous silica sol containing from about 20 to about 40 weight percent silica, based on the weight of the aqueous silica sol to provide a wetted support which contains up to the maximum amount of aqueous silica sol which the support can sorb without having the appearance of liquid on the outer surface of said wetted support;
(2) coating the outer surface of said wetted support with a uniformly appearing coating of a dried precursor of a finely divided catalytically active oxide material for the oxidation of olefinically unsaturated hydrocarbons to the corresponding unsaturated aldehydes, said precursor having been previously heated at a temperature of from about 200° C. to about 350° C. in the presence of molecular oxygen to remove the majority of the volatiles therefrom;
(3) calcining said coated wetted support at a temperature of from about 400° C. to about 570° C. for a period of time sufficient to provide a catalyst having the desired catalytic activity and an extended catalyst life.

4,276,197
PREPARATION OF A TITANIUM PROMOTED $VO(PO_3)_2$ OXIDATION CATALYST
James C. Vartuli, West Chester, Pa., and Lee R. Zehner, Dublin, Ohio, assignors to Atlantic Richfield Company, Los Angeles, Calif.
Filed Dec. 19, 1979, Ser. No. 105,365
Int. Cl.³ B01J *27/14, 31/02*
U.S. Cl. 252—435 **13 Claims**

1. A method for the preparation of a titanium promoted single phase crystalline vanadium(IV)bis(metaphosphate) hydrocarbon oxidation catalyst which comprises the steps of:
forming a slurry of vanadyl sulfate, titanium dioxide, acetic anhydride and phosphorus pentoxide with the liberation of exothermic heat;
introducing said slurry into a heating zone and maintaining said zone at a temperature of at least about 325° C. for a period sufficient for the liberation of gases and forming a titanium-vanadium-phosphorus reaction product;
cooling the reaction product and washing with water to essentially remove any soluble residue;
drying the water washed product and calcining in air to obtain a titanium containing single phase crystalline vanadium(IV)bis(metaphosphate) catalyst.

4,276,198
DESTRUCTION METHOD FOR THE WET COMBUSTION OF ORGANICS
Richard A. Miller, Knoxville, Tenn., assignor to IT Enviroscience, Inc., Knoxville, Tenn.
Division of Ser. No. 16,645, Mar. 1, 1979, Pat. No. 4,212,735. This application Oct. 25, 1979, Ser. No. 88,272
Int. Cl.³ B01J *27/24, 27/06*
U.S. Cl. 252—438 **6 Claims**

1. A cocatalyst system useful for the oxidation of organic compounds in an aqueous system of pH not more than about 4 to reduce the total organic content of the system, the composition comprising a catalytic combination of:
(1) nitrate ions,
(2) at least one of either bromide ions or iodide ions, and
(3) transition metal ions of at least one transition metal selected from the group consisting of vanadium, cobalt, molybdenum, manganese and ruthenium.

4,276,199
SUPPORTED MOLYBDENUM/TUNGSTEN COMPOSITIONS

Ronald J. Hoxmeier, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 21, 1980, Ser. No. 170,352
Int. Cl.³ B01J *21/00, 23/24, 27/00*
U.S. Cl. 252—438 **8 Claims**

1. A composition prepared by impregnating a porous, inert support with an aqueous solution of $H_4Mo(CN)_8$, $H_4W(CN)_8$ or mixtures thereof, drying the impregnated support and calcining the impregnated support in a non-oxidizing environment at a temperature ranging from about 400° to about 600° C.

2. The composition of claim 1 wherein the support is alumina, silica or mixtures thereof.

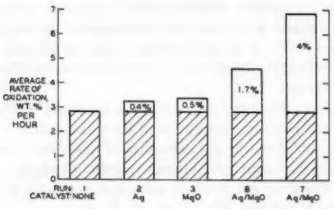
4. A process for preparing a molybdenum-and/or tungsten-containing composition which process comprises impregnating a porous, inert support with an aqueous solution of $H_4Mo(CN)_8$, $H_4W(CN)_8$ or mixtures thereof, drying the impregnated support and calcining the impregnated support in a non-oxidizing environment.

6. The process of claim 4 wherein the $H_4Mo(CN)_8$ or $H_4W(CN)_8$ is prepared from the corresponding alkali metal cyanide, $M_4Mo(CN)_8$ (where M=Li, Na, K, Rb or Cs) by ion exchanging said cyanide with the hydrogen form of a strong acid ion exchange resin.

4,276,200
CATALYST AND PROCESS FOR PRODUCING HYDROPEROXIDES

Yulin Wu; Marvin M. Johnson, and Gerhard P. Nowack, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 930,077, Aug. 1, 1978, Pat. No. 4,201,875. This application Nov. 14, 1979, Ser. No. 94,253
Int. Cl.³ B01J *27/20, 23/50, 23/06, 21/10*
U.S. Cl. 252—443 **3 Claims**



1. A composition consisting essentially of metallic silver supported on an inorganic support selected from the group consisting of zinc oxide and a zinc oxide-calcium carbonate mixture, wherein the amount of silver in said composition is in the range of from about 0.05 to about 10 weight percent based upon the total weight of the composition.

4,276,201
CATALYST AND HYDROCONVERSION PROCESS UTILIZING THE SAME

Willard H. Sawyer, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 66,572, Aug. 15, 1979, abandoned. This application Jun. 2, 1980, Ser. No. 155,206
Int. Cl.³ B01J *21/12, 23/76*
U.S. Cl. 252—455 R **9 Claims**

1. A catalyst comprising:

(a) a support having initially a surface area ranging from about 350 to about 500 m^2/g, a total pore volume of about 1.0 to about 2.5 cc/g, not more than about 0.2 cc/g of said pore volume being in pores having a diameter of more than about 400 Angstroms, said support comprising agglomerates of alumina and silica, said silica comprising less than about 10 weight percent of said support, said agglomerates having been prepared in an agglomeration zone, under agglomeration conditions, including maintaining the heat introduced into said agglomeration zone in the range of about 10,000 to about 25,000 British thermal units per hour per pound of said alumina, and

(b) a hydrogenation component selected from the group consisting of elemental metal, metal oxide, metal sulfide of a Group VIB metal and an elemental metal, metal oxide and metal sulfide of a Group VII metal and mixtures thereof of the Periodic Table of Elements.

4,276,202
PROCESS FOR THE MANUFACTURE OF ELECTRODES HAVING PEROVSKITE STRUCTURE FOR ELECTROCHEMICAL HIGH TEMPERATURE CELLS

Rainer Schmidberger, Bermatingen, and Wolfgang Dönitz, Immenstaad, both of Fed. Rep. of Germany, assignors to Dornier System GmbH, Fed. Rep. of Germany

Filed Aug. 13, 1979, Ser. No. 66,227
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1978, 2837118
Int. Cl.³ B01J *21/10, 23/06, 23/10, 23/26*
U.S. Cl. 252—462 **7 Claims**

1. A process for the manufacture of electrode material having a perovskite structure for electrochemical high temperature cells and measuring sondes having oxygen ion-conducting solid electrolytes based on zirconium dioxide or cerium dioxide, comprising an admixture of mixed oxides based on $LaMnO_3$ or $LaNiO_3$ or $LaCoO_3$, and small amounts of chromium and monovalent or bivalent cations selected from the group of the alkali elements or the alkaline earth elements or of Zn, Cd, Mg, Sn, or Pb, which comprises spraying into a hot reaction zone a solution of metal compounds in a stoichiometric ratio and at a temperature of about 1000° to 1500° K., in the presence of sufficient oxygen for reaction,

evaporating the solvent from the non-volatile constituents,

whereby during further passage of the constituents through the hot reaction zone, mixed oxides are formed having the desired composition with homogeneous element distribution, particularly chromium distribution, in the atomic range,

and separating said oxides from solvent vapors.

4,276,203
CATALYTIC SYSTEM AND PROCESS FOR PRODUCING IT

William C. Pfefferle, Middletown, N.J., assignor to Acurex Corporation, Mountain View, Calif.

Filed Apr. 26, 1979, Ser. No. 33,705
Int. Cl.³ B01J *21/04, 23/10, 23/58, 23/64*
U.S. Cl. 252—462 **16 Claims**

1. In a process for forming a catalytic bed with a porous support structure of a low surface area ceramic, the steps of applying onto the surface of the support structure a mixture consisting essentially of a solution of a solvent and a salt which decomposes to form a refractory oxide, drying the solution to remove the solvent therefrom, decomposing the salt into the oxide leaving a refractory oxide adhering within the surface pores of the support structure, impregnating the surface with a solution of an active catalytic material, and drying the last-mentioned solution to remove the solvent therefrom.

4,276,204

COMPOSITION OF A CONDUCTIVE CERAMIC GLAZE AND IMPROVED METHOD OF FORMING SAME

Victor Chester, Allentown, N.J., assignor to General Porcelain Mfg. Co., Trenton, N.J.

Filed Jan. 8, 1979, Ser. No. 1,986
Int. Cl.[3] H01B 1/06
U.S. Cl. 252—519 20 Claims

1. An improved electrically conductive composition for glazing a ceramic mold form including a first combination comprising:
(a) feldspar: 30.0–35.0 percent by weight;
(b) flint: 18.0–22.0 percent by weight;
(c) calcium carbonate: 7.0–11.0 percent by weight:
(d) ball clay: 1.0–2.0 percent by weight
(e) kaolin: 2.0–4.2 percent by weight;
(f) zinc oxide: 5.0–10.0 by weight
(g) black iron oxide: 25.0–30.0 by weight

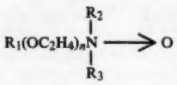
4,276,205

DETERGENT COMPOSITIONS CONTAINING AMINE OXIDE AND NONIONIC SURFACTANTS AND POLYETHYLENE GLYCOL

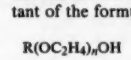
Merle W. Ferry, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 4, 1980, Ser. No. 117,904
Int. Cl.[3] C11D 3/37
U.S. Cl. 252—528 37 Claims

1. A detergent composition especially useful for cold-water fabric laundering, comprising:
(a) from about 1% to about 20% by weight of an amine oxide surfactant of the formula



wherein R_1 is a C_{10}–C_{18} hydrocarbyl or substituted hydrocarbyl lipophilic group, R_2 and R_3 are each C_1–C_3 hydrocarbyl or substituted hydrocarbyl groups, and n is from 0 to about 10;
(b) from about 1% to about 25% by weight of an ethoxylated alcohol or ethoxylated alkyl phenol nonionic surfactant of the formula



wherein R is selected from the group consisting of aliphatic hydrocarbyl groups containing from about 8 to about 18 carbon atoms, alkyl phenyl groups wherein the alkyl group contains from about 8 to about 15 carbon atoms, and mixtures thereof, and n is from about 3 to about 9; and
(c) from about 0.1% to about 9% by weight of a polyethylene glycol having an average molecular weight of from about 2,000 to about 40,000.

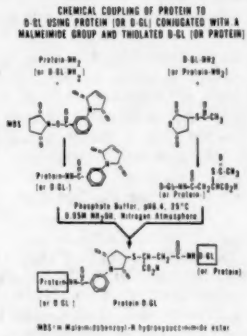
4,276,206

IMMUNOCHEMICAL CONJUGATES: METHOD AND COMPOSITION

David H. Katz, La Jolla, Calif., assignor to Scripps Clinic & Research Foundation, La Jolla, Calif.

Division of Ser. No. 4,333, Jan. 18, 1979, Pat. No. 4,220,565, which is a continuation-in-part of Ser. No. 764,586, Feb. 2, 1977, Pat. No. 4,191,668. This application Feb. 11, 1980, Ser. No. 120,067
Int. Cl.[3] C08L 77/04, 89/00; A61K 37/02, 37/26
U.S. Cl. 260—6 3 Claims

1. The method of preparing therapeutic immunosuppressive conjugates of D-glutamic acid-D-lysine copolymer with antigen comprising the steps of:
(a) introducing biotin into the D-glutamic acid-D-lysine copolymer molecule to form D-GL(biotin);
(b) reacting D-GL(biotin) with either m-maleimidobenzoyl-N-hydroxysuccinimide ester to form MB-D-GL(biotin) or with S-acetylmercaptosuccinic anhydride to form SH-D-GL(biotin);
(c) reacting antigen with either m-maleimidobenzoyl-N-hydroxysuccinimide ester to form MB-Antigen or with S-acetylmercaptosuccinic anhydride to form SH-Antigen;


CHEMICAL COUPLING OF PROTEIN TO
D-GL USING PROTEIN (OR D-GL) CONJUGATED WITH A
MALEIMIDE GROUP AND THIOLATED D-GL (OR PROTEIN)
Phosphate Buffer, pH6.4, 25°C
0.05M NaOH, Nitrogen Atmosphere
Protein D-GL

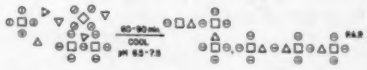
(d) reacting MB-D-GL(biotin) with SH-Antigen or reacting SH-D-GL(biotin) with MB-Antigen to form conjugates of D-glutamic acid-D-lysine(biotin) with antigen; and
(e) separating said D-glutamic acid-D-lysine(biotin)-antigen conjugate from non-conjugated antigen by affinity chromatography on an avidin-Sepharose chromatographic column.

4,276,207

PIGMENT AGGLOMERATE COLORING SYSTEM

David Lester, Arlington, and Robert Alexander, Waltham, both of Mass., assignors to Polymerics, Inc., Waltham, Mass.

Filed Aug. 14, 1979, Ser. No. 66,618
Int. Cl.[3] C08L 1/28, 3/02
U.S. Cl. 260—17 R 42 Claims



1. A pigment micro-agglomerate coloring system comprising:
a solution of acetylated starch in water,
an organic acid sufficient to raise the solution to a pH of from 4 to 5,
a polyhydric alcohol,
hydrophobic pigment particles, and
a base sufficient to readjust the pH of the resultant suspension to from 6.5 to 7.5.

4,276,208

GLASS FIBER-REINFORCED THERMOPLASTIC POLYESTER COMPOSITION

Yoshinari Ogawa; Teruhisa Fukumoto, and Kohichi Sakai, all of Sagamihara, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Oct. 9, 1979, Ser. No. 82,970

Claims priority, application Japan, Oct. 9, 1978, 53/123569; Oct. 11, 1978, 53/124099; Oct. 11, 1978, 53/124100; Oct. 30, 1978, 53/132503

Int. Cl.³ C08L *91/00*

U.S. Cl. 260—28 R **11 Claims**

1. A glass fiber-reinforced thermoplastic polyester composition comprising

(A) 100 parts by weight of polyethylene terephthalate having an intrinsic viscosity, measured at 35° C. in orthochlorophenol, of from 0.4 to 0.9,

(B) from 0.05 to 3 parts by weight of a salt of montan wax,

(C) from 5 to 200 parts by weight of glass fibers having an average length of at least 0.2 mm, and

(D) from 0 to 5 parts by weight of an epoxy compound having at least two epoxy groups in the molecule.

4,276,209

CO-CONDENSATES BASED ON PHENOL-BUTYRALDEHYDE RESINS, THEIR PREPARATION AND THEIR USE

Harro Petersen, Frankenthal; Hans-Joachim Krause; Kurt Fischer, both of Ludwigshafen; Adolph Segnitz, Bad Durkheim, and Horst Zaunbrecher, Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 23, 1979, Ser. No. 87,577

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1978, 2847030

Int. Cl.³ C08L *91/06, 61/08*

U.S. Cl. 260—28 P **10 Claims**

1. A process for the preparation of a co-condensation product based on a phenol and butyraldehyde, comprising:

condensing a butyraldehyde with a phenolic compound in a mole ratio of 0.8 to 2.0 moles aldehyde per mole of phenolic compound and adding to said reactants before, during or after condensation from 5 to 50% by weight, based on the mixture of phenol and butyraldehyde, of a thermoplastic which can react with said phenol-butyraldehyde co-condensation product containing functional groups selected from the group consisting of ester, amide, hydroxyl, amine, carboxyl, anhydride, SH, carbamate, isocyanate, urea, N-methylol, NH groups and halogen atoms, the co-condensation reactions with said thermoplastic being conducted at a temperature of 80° to 220° C.

4,276,210

WATER-DILUTABLE LACQUER BINDERS FOR CHEMICALLY RESISTANT COATINGS

Peter Höhlein, and Jochen Schoeps, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 20, 1979, Ser. No. 95,963

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1978, 2850872

Int. Cl.³ C08L *33/02*

U.S. Cl. 260—29.4 UA **3 Claims**

1. A water-dilutable lacquer binder comprising a mixture of

A. 20–94% by weight of a copolymer consisting of copolymerised units of

(a) 30–65% by weight of an aromatic vinyl or isopropenyl compound having 8–14 C-atoms or of a methacrylic acid alkyl ester having 1–4 C-atoms in the alcohol component, or any mixture thereof;

(b) 10–30% by weight of at least one acrylic acid alkyl ester having 1 to 8 C-atoms in the alcohol component;

(c) 1–20% by weight of maleic acid, fumaric acid, itaconic acid or their semi-esters having 1–8 C-atoms in the alcohol component, (meth)acrylic acid or any mixture of the aforesaid monomers;

(d) 5–20% by weight of at least one hydroxyalkyl ester of (meth)acrylic acid having 2–4 C-atoms in the alkyl group or glycidyl (meth)acrylate or any mixture of the aforesaid monomers; and

(e) 10–30% by weight of N-methylol (meth)acrylic acid amide or N-methoxymethyl (meth)acrylic acid amide or any mixture thereof;

B. 1–40% by weight of a saturated lactam, and

C. 5–40% by weight of an aminoplast resin;

wherein 30–100% of the number of carboxyl groups of component A.c. incorporated in the copolymer have been neutralised by ammonia or monoamines or polyamines.

4,276,211

STABILIZATION COMPOSITION FOR COATING COMPOSITION

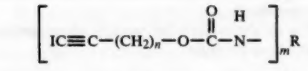
William Singer, Teaneck; Milton Nowak, South Orange, and Norma Ingles, Edison, all of N.J., assignors to Troy Chemical Corporation, Newark, N.J.

Filed Mar. 10, 1980, Ser. No. 129,058

Int. Cl.³ C08L *23/00;* **C09D** *5/14*

U.S. Cl. 260—29.6 MN **22 Claims**

1. A composition adapted for use in coating applications which contains at least one iodo compound having the formula:



in which R is an alkyl, aryl, alkaryl, alkene, cyclohexyl or similar group having one to not more than 20 carbon atoms and having from one to three linkages corresponding to m and n and m are whole number integers between 1 and 3 and may be the same or different, and at least one organic epoxy compound.

4,276,212

HIGH SOLIDS COATING COMPOSITION OF A LOW MOLECULAR WEIGHT ACRYLIC POLYMER AND AN ALKYLATED MELAMINE CROSS-LINKING AGENT

Ram-Tirth Khanna, Wilmington, Del., and Robert L. Turner, Troy, Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 968,364, Dec. 11, 1978, abandoned, which is a continuation of Ser. No. 807,735, Jun. 17, 1977, abandoned, which is a continuation-in-part of Ser. No. 600,367, Jul. 30, 1975, abandoned. This application Mar. 7, 1980, Ser. No. 128,113

Int. Cl.³ C08L *31/00, 33/14, 61/28*

U.S. Cl. 260—39 R **25 Claims**

1. A high solids coating composition comprising at least 50% by weight of a binder of film-forming constituents and up to 50% by weight of a liquid carrier; in which the film-forming constituents consist essentially of

(A) about 50–95% by weight of an acrylic polymer having a number average molecular weight determined by gel permeation chromotography of about 500–4,500, a hydroxyl content of about 2–10% by weight, a glass transition temperature of about −20° C. to +20° C. and containing about 2–10% by weight of a chain transfer agent and consisting essentially of

methyl methacrylate, an alkyl methacrylate or an alkyl acrylate each having 2–12 carbon atoms in the alkyl groups and a hydroxyl alkyl acrylate or a hydroxy alkyl methacrylate each having 2–4 carbon atoms in the alkyl group and

(B) about 5–50% by weight of an alkylated melamine formaldehyde cross-linking agent having 1–4 carbon atoms in

the alkyl group and in addition to the film-forming constituents 0.1–2% by weight of an acid catalyst.

4,276,213

PROCESS FOR THE COLORATION OF ORGANIC MATERIAL OF HIGH MOLECULAR WEIGHT IN THE MELT WITHIN ANTHRAQUINONE DYES

Max Jost, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

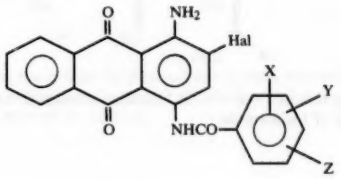
Filed Jun. 18, 1979, Ser. No. 49,820

Claims priority, application Switzerland, Jun. 29, 1978, 7100/78

Int. Cl.[3] **C07C** *103/75;* **C08K** *5/08*

U.S. Cl. 260—40 R **12 Claims**

1. A process for colouring organic material of high molecular weight in the melt, which comprises homogeneously mixing said organic material with a colourant of the formula



wherein Hal represents a chlorine or bromine atom, X represents a hydrogen or halogen atom, an alkyl or alkoxy group of 1 to 6 carbon atoms, an alkoxycarbonyl group of 2 to 7 carbon atoms, a phenyl group or a phenoxy group which is unsubstituted or substituted by chlorine atoms or methyl groups, and Y and Z represent hydrogen or halogen atoms or methyl groups.

4,276,214

FLUORINE-CONTAINING RESIN COMPOSITION HAVING IMPROVED THERMAL STABILITY

Tatsushiro Yoshimura, Takatsuki, and Shigetake Tominaga, Ibaraki, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Jun. 6, 1979, Ser. No. 46,047

Claims priority, application Japan, Jun. 9, 1978, 53/70202; Jun. 9, 1978, 53/70203

Int. Cl.[3] **C08K** *5/58, 5/57, 3/10, 5/43, 5/18*

U.S. Cl. 260—45.75 K **9 Claims**

1. A melt-processable fluorine-containing resin composition having an improved thermal stability which comprises a melt-processable fluorine-containing resin selected from the group consisting of:

(a) tetrafluoroethylene-hexafluoropropylene copolymers containing tetrafluoroethylene and hexafluoropropylene residues in a weight ratio of 95:5 to 75:25;

(b) tetrafluoroethylene-perfluorovinyl ether copolymers containing tetrafluoroethylene and perfluorovinyl ether residues in a weight ratio of 98:2 to 90:10;

(c) tetrafluoroethylene-ethylene copolymers containing tetrafluoroethylene and ethylene residues in a weight ratio of 70:30 to 90:10;

(d) tetrafluoroethylene-ethylene-propylene copolymers containing tetrafluoroethylene, ethylene and propylene residues in a weight ratio of 40 to 65:25 to 50:2 to 20;

(e) a chlorotrifluoroethylene homopolymer;

(f) chlorotrifluoroethylene-ethylene copolymers containing chlorotrifluoroethylene and ethylene residues in a weight ratio of 75:25 to 85:15;

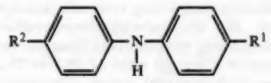
(g) a vinylidene fluoride homopolymer;

(h) vinylidene fluoride-tetrafluoroethylene copolymers containing vinylidene fluoride and tetrafluoroethylene residues in a weight ratio of 70:30 to 90:10; and

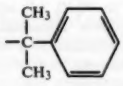
(i) vinylidene fluoride-hexafluoroisobutylene copolymers containing vinylidene fluoride and hexafloroisobutylene residues in a weight ratio of 40:60 to 70:30,

and a stabilizing amount of at least one thermal stabilizer selected from the group consisting of:

(A) an amine antioxidant selected from the group consisting of dinaphthylamine, phenyl-α-naphthylamine, phenyl-β-naphthylamine, diphenyl-p-phenylenediamine, di-β-naphthyl-p-phenylenediamine, phenylcyclohexyl-p-phenylene diamine, aldol-α-naphthyl-diphenylamine, a reaction product of diphenylamine and diisobutylene, and a diphenylamine derivative having the formula:

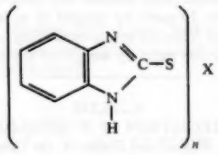


wherein R^1 and R^2 are

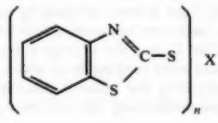


or octyl group; and

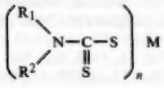
(B) an organosulfurous compound selected from the group consisting of benzoimidazole type mercaptans having the formula:



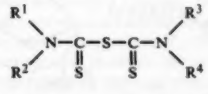
wherein X is H, Zn, Sn or Cd, and n is an integer of 1 to 4; benzothiazole type mercaptan compounds and their salts having the formula:



wherein X is H, Zn, Sn or Cd, and n is an integer of 1 to 4; dithiocarbamic acids and their salts having the formula:

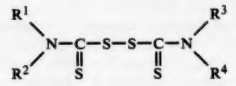


wherein R^1 and R^2 are an alkyl or aryl group having 2 to 16 carbon atoms, M is H, Zn, Sn, Cd or Cu and n is an integer of 1 to 4; a thiuram compound having the formula:



wherein R^1, R^2, R^3 and R^4 are an alkyl or aryl group having 2

to 16 carbon atoms; and a thiuram compound having the formula:



wherein R^1, R^2, R^3 and R^4 are an alkyl or aryl group having 2 to 16 carbon atoms.

7. A melt-processable fluorine-containing resin composition having an improved thermal stability which comprises a melt-processable fluorine-containing resin selected from the group consisting of: (a) tetrafluoroethylene-hexafluoropropylene copolymers containing tetrafluoroethylene and hexafluoropropylene residues in a weight ratio of 95:5 to 75:25, (b) tetrafluoroethylene-perfluorovinyl ethers containing tetrafluoroethylene and perfluorovinyl ether residues in a weight ratio of 98:2 to 90:10, (c) tetrafluoroethylene-ethylene copolymers containing tetrafluoroethylene and ethylene residues in a weight ratio of 70:30 to 90:10, (d) tetrafluoroethylene-ethylene-propylene copolymers containing tetrafluoroethylene, ethylene and propylene residues in a weight ratio of 40 to 60: 25 to 50:2 to 20, (e) a chlorotrifluoroethylene homopolymer, (f) chlorotrifluoroethyleneethylene copolymers containing chlorotrifluoroethylene and ethylene residues in a weight ratio of 75:25 and 85:15, (g) a vinylidene fluoride homopolymer, (h) vinylidene fluoride-tetrafluoroethylene copolymers containing vinylidene fluoride and tetrafluoroethylene residues in a weight ratio of 70:30 to 90:10, and (i) vinylidene fluoride-hexafluoroisobutylene copolymers containing vinylidene fluoride and hexafluoroisobutylene residues in a weight ratio of 40:60 to 70:30 and 0.05 to 10 parts by weight of at least one thermal stabilizer selected from the group consisting of tin powder and zinc powder per 100 parts by weight of the resin.

4,276,215
PURIFICATION OF PYRROLIDONE

Eugene V. Hort, Wayne, and Waldo R. De Thomas, Parsippany, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Jul. 25, 1977, Ser. No. 818,564
Int. Cl.³ C07D *201/16*
U.S. Cl. 260—326.5 FN **8 Claims**

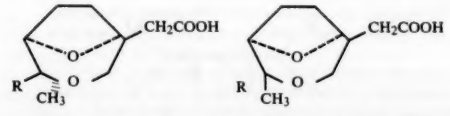
1. A process for removing impurities from 2-pyrrolidone comprising the steps of continuously passing the impure liquid 2-pyrrolidone through a zone containing calcium oxide in particulate form, said zone being maintained at a temperature of about 80° to 250° C. and the average residence time of the pyrrolidone in said zone ranging from about 5 minutes to 10 hours, rapidly distilling the effluent calcium salt-containing 2-pyrrolidone, and condensing the purified 2-pyrrolidone.

4,276,216
SYNTHESIS OF DIOXABICYCLO[3.2.1]OCTANES AND OXEPANES

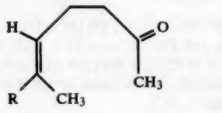
Zoltan G. Hajos, Princeton, and Michael P. Wachter, Bloomsbury, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Jul. 31, 1980, Ser. No. 174,070
Int. Cl.³ C07D *319/10*
U.S. Cl. 260—340.6 **13 Claims**

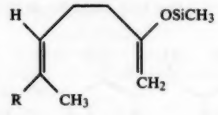
1. The process for the preparation of compounds of the formula:



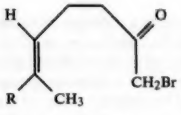
which comprises reacting a compound of the formula:



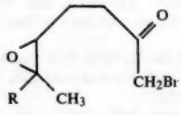
with lithium diisopropylamide followed by reaction of the intermediate with trimethylsilyl chloride to form a silyl enol ether of the formula:



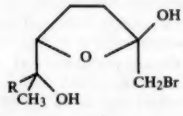
reacting the enol ether with N-bromosuccinimide to form a bromide of the formula:



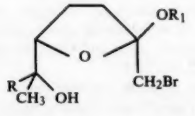
reacting the bromide with a peracid to form an epoxide of the formula:



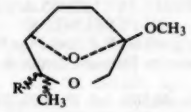
reacting the epoxide with an acid to form a hemi-ketal of the formula:



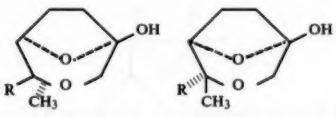
reacting the hemi-ketal with a trialkylorthoformate to form a ketal of the formula:



reacting the ketal with a cyclizing agent to form an oxido oxepane of the formula:

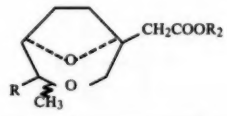


reacting the oxido oxepane with dilute acid to give a mixture of epimeric hemi-ketals of the formula:

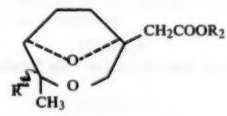


A B

separating the epimers by physical means and i. reacting Compound A with a carbalkoxymethylenetriphenylphosphorane to form an ester of the formula:

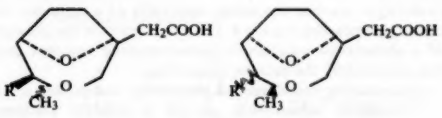


and hydrolyzing the ester with a base; and ii. reacting Compound B with a carbalkoxymethylenetriphenylphosphorane to form an ester of the formula:

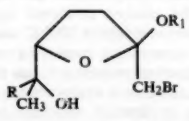


and hydrolyzing the ester with a base, wherein R is a straight or branched chain alkyl group having 1–12 carbon atoms and R_1 and R_2 are lower alkyl having 1–5 carbon atoms.

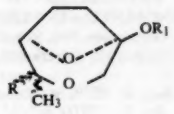
9. The process for the preparation of compounds of the formula



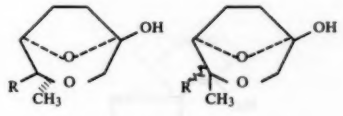
which comprises reacting a ketal of the formula:



with a cyclizing agent to form an oxido-oxepane of the formula:

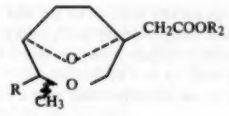


reacting the oxido-oxepane with dilute acid to give a mixture of epimeric hemi-ketals of the formula:

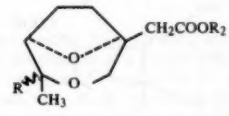


A B

separating the epimers by physical means and i. reacting Compound A with a carbalkoxymethylenetriphenylphosphorane to form an ester of the formula:



and hydrolyzing the ester with a base; and ii. reacting Compound B with a carbalkoxymethylene triphenylphosphorane to form an ester of the formula:



and hydrolyzing the ester with a base, wherein R is a straight or branched chain alkyl group having 1–12 carbon atoms and R_1 and R_2 are lower alkyl having 1–5 carbon atoms.

4,276,217

METHOD FOR PRODUCING 1,5-DIMETHYL-6,8-DIOXABICYCLO[3.2.1]OCTANE

Teruaki Mukaiyama, Tokyo, and Yoji Sakito, Ibaraki, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 21, 1980, Ser. No. 170,955

Claims priority, application Japan, Jul. 31, 1979, 54/98361; Jul. 31, 1979, 54/98362

Int. Cl.³ C07D *317/44*

U.S. Cl. 260—340.9 R **7 Claims**

1. A process for producing an optically active or a racemic 1,5-dimethyl-6,8-dioxabicyclo[3.2.1]octane, which comprises reacting an optically active or a racemic 2,6-dimethyl-6-hepten-1,2-diol with ozone at a temperature of −80° to 0° C. within 10 hours in an inert solvent, to obtain the optically active or racemic ozonide and reductive working up said ozonide with a reducing agent at a temperature of −80° to 30° C. within the range of 10 minutes to 2 hours in an inert solvent.

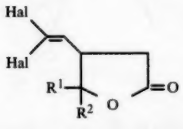
4,276,218

PREPARATION OF DIHALOGENOVINYL-γ-BUTYROLACTONES

Reinhard Lantzsch, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 16, 1979, Ser. No. 67,241
Int. Cl.³ C07D *307/32*
U.S. Cl. 260—343.6 **4 Claims**

1. In the preparation of a dihalogenovinyl-γ-butyrolactone of the formula

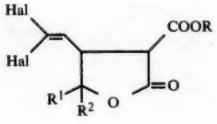


in which

Hal each independently is F, Cl or Br, and

R^1 and R^2 each independently is C_{1-4}-alkyl, or R^1 and R^2 together with the adjacent carbon atoms form a cycloaliphatic ring with up to 7 carbon atoms,

by hydrolyzing to the corresponding acid a compound of the formula



in which R is C_{1-4}-alkyl, and then decarboxylating, the improvement which comprises effecting hydrolysis in acidic aqueous solution and heating the hydrolysis mass, without isolation of the intermediate hydrolysis product, at a temperature of about 110° to 120° C.

4,276,219

5-KETO-L-ASCORBIC ACID-5,5-DIMETHYL KETAL, DERIVATIVES THEREOF AND ITS USE AS AN ANTIOXIDANT AND INTERMEDIATE

Glenn C. Andrews, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jul. 20, 1979, Ser. No. 59,417
Int. Cl.³ C07D *307/62*
U.S. Cl. 260—343.7 **1 Claim**

1. A process for making L-ascorbic acid which comprises reacting 5-keto-L-ascorbic acid-5,5-dimethyl ketal with sodium borohydride in a trifluoroacetic acid medium.

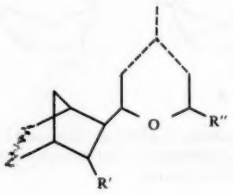
4,276,220

NOVEL NORBORNYL-SUBSTITUTED PYRANS, METHOD FOR THEIR SYNTHESIS AND USE THEREOF IN PERFUMERY

Brian J. Willis, Bergenfield, N.J., and John W. Dittrick, Flushing, N.Y., assignors to Fritzsche Dodge & Olcott, Inc., New York, N.Y.

Division of Ser. No. 60,589, Jul. 25, 1979, Pat. No. 4,221,679. This application Feb. 22, 1980, Ser. No. 123,654
Int. Cl.³ C07D *309/18*
U.S. Cl. 260—345.1 **5 Claims**

1. A norbornyl-substituted pyran of the formula:



wherein the wavy line represents either a carbon-carbon single bond or a carbon-carbon double bond; and wherein the dashed lines represent either a carbon-carbon single bond or a carbon-carbon double bond such that two of the three dashed lines represent carbon-carbon single bonds; and wherein each R′ and R″, individually, is either hydrogen or a methyl group.

4,276,221

Patent Not Issued For This Number

4,276,222

METHOD OF PRODUCING MALEIC ANHYDRIDE

Ramon A. Mount, and Warn D. Robinson, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 26, 1979, Ser. No. 106,567
Int. Cl.³ C07D *307/60*
U.S. Cl. 260—346.75 **16 Claims**

1. In a method for the preparation of maleic anhydride by oxidizing a reactant consisting essentially of a saturated aliphatic hydrocarbon having 4–10 carbon atoms in the presence of a phosphorus-vanadium-oxygen-containing complex catalyst prepared by the process comprising:

(a) contacting vanadium and phosphorus compounds under conditions which will provide a catalyst precursor wherein greater than 50 atom % of the vanadium is in the tetravalent state;

(b) recovering the catalyst precursor;

(c) forming the catalyst precursor into agglomerates; and

(d) calcining the catalyst precursor agglomerations at a temperature between about 300° C. and 600° C.

the improvement comprising employing, as the catalyst, the product of the improved process wherein the catalyst precursor after being formed into agglomerates is wetted with an aqueous liquid in an amount sufficient to enhance surface adhesion and then dried prior to calcining whereby attrition of the catalyst during the oxidizing of the reactant is substantially reduced.

4,276,223
PREPARATION OF VICINAL EPOXIDES

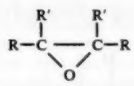
Yulin Wu, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 73,819, Sep. 10, 1979, which is a division of Ser. No. 934,667, Aug. 17, 1978, Pat. No. 4,192,810, which is a division of Ser. No. 845,183, Oct. 25, 1977, Pat. No. 4,111,965, which is a division of Ser. No. 459,628, Apr. 10, 1974, Pat. No. 4,069,234. This application Jul. 14, 1980, Ser. No. 168,922

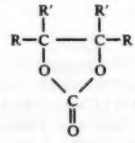
Int. Cl.³ C07D *301/02*

U.S. Cl. 260—348.16 **5 Claims**

1. A process for the preparation of a vicinal epoxide having 2 to 30 carbon atoms per molecule of the general formula



wherein each R and each R′ are individually selected from the group consisting of hydrogen and hydrocarbyl radical groups having 1 to 10 carbon atoms and wherein both R′ radicals in said epoxide can represent a divalent aliphatic hydrocarbon radical which together with the oxirane group in said epoxide can form a cycloaliphatic nucleus, which comprises heating the corresponding carbonate ester having the general formula



wherein R and R′ are as defined above, in the presence of a catalytic amount of metal salt catalyst selected from the group consisting of the halides, sulfates and carboxylates having 1 to 20 carbon atoms of manganese.

4,276,224
ANTHRAQUINONE SULPHONAMIDE COMPOUNDS AND PREPARATION

Donald R. Randell, Stockport, and Emyr Phillips, Sale, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

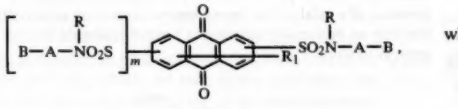
Filed Jul. 12, 1979, Ser. No. 57,157

Claims priority, application United Kingdom, Jun. 7, 1978, 26466/78

Int. Cl.³ C07C *143/665*

U.S. Cl. 260—371 **12 Claims**

1. A compound identified as,



wherein A is a C_1–C_4 straight or branched chain alkylene radical,

B is a —SO_3M, —CO_2M, —PO_3HM or —PO_3M_2 grouping,

M is hydrogen or a cation giving a water-soluble derivative,

R is hydrogen, a cation giving a water-soluble derivative or a C_1–C_4 straight or branched chain alkyl,

R_1 is hydrogen, methyl or —COOH, and m is 1,

with the proviso that when B is —SO_3M, A cannot be ethylene and R cannot be methyl.

4,276,225
DECARBALKOXYLATION OF CARBOXYLIC ACID ESTERS

Reinhard Lantzsch, Cologne, and Hellmut Hoffmann, Wuppertal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

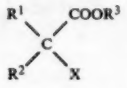
Filed Aug. 8, 1977, Ser. No. 822,967

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1976, 2638453

Int. Cl.³ C07C *67/32, 45/65, 120/00*

U.S. Cl. 260—408 **8 Claims**

1. A process for the decarbalkoxylation of a carboxylic acid ester of the formula



in which

X is $COOR^4$, COR^5 or CN,

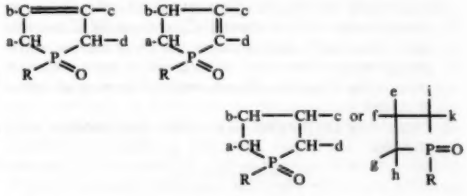
R^1 and R^2 each independently is hydrogen, alkyl, alkenyl, alkynyl, aryl or aralkyl or, R^1 and R^2, together with the adjacent carbon atom, form a cycloaliphatic ring which is optionally substituted by CN, alkyl, alkenyl, aryl, aralkyl, thioalkyl or thioaryl, the substituents of the cycloaliphatic ring optionally being substituted by halogen,

R^3 and R^4 each independently is alkyl, and

R^5 is alkyl, alkenyl, aryl or aralkyl, or R^4 or R^5 forms a ring with R^2 and the intermediate atoms,

to give a product of the formula

which comprises heating the carboxylic acid ester at about 100°–250° C. in the presence of a solvent containing phosphorus and in the presence of about 0.1 to 1.5 times the molar amount of a salt, the solvent containing phosphorus being selected from the group consisting of at least one phospholine oxide or phosphetane oxide of the formula



wherein

a, b, c and d each independently is H, alkyl, alkenyl, aryl, aralkyl, alkoxy, Cl or Br, or are a tetramethylene radical which, together with two adjacent carbon atoms of the heterocyclic ring, form a 6-carbon atom cycloaliphatic ring, provided that if a, b, c and d are aliphatic, they contain a total of not more than 6 carbon atoms and that the solvent contains not more than 3 aromatic rings,

e, f, g, h, i and k each independently is H or C_1–C_4-alkyl, and

R is C_1–C_{18}-alkyl, C_2–C_{18}-alkenyl, C_6–C_{14}-aryl or C_7–C_{20}-aralkyl, any of which is optionally substituted by alkoxy or halogen,

and the salt comprising a halide, cyanide, thiocyanate or azide, and then separating the ester formed.

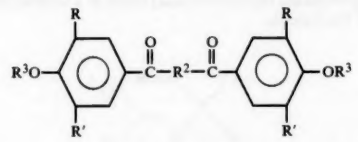
4,276,226

METHYL- AND CHLORO- SUBSTITUTED AROMATIC DIKETODIOLS

Robert A. Clement, and Burton C. Anderson, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 23, 1979, Ser. No. 59,890
Int. Cl.[3] C09F *5/08;* C07C *49/784, 49/792, 69/017*
U.S. Cl. 260—410.5 13 Claims

1. Diketodiol or diester of the formula



wherein R is independently methyl or chloro; R′ is independently hydrogen or R; R^2 is 1,4-phenylene, 1,3-phenylene, 2,6-naphthylene, 4,4′-biphenylene or 4,4′-biphenylene ether and R^3 is hydrogen or

where R^4 is a hydrocarbon group of 1–10 carbon atoms.

4,276,227

METHOD OF TREATING EDIBLE OIL WITH ALKALI USING INTERFACIAL SURFACE MIXER

Charles E. Kirby, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 7, 1980, Ser. No. 128,053
Int. Cl.[3] C11B *3/06*
U.S. Cl. 260—425 25 Claims

1. A method for refining, dewaxing or combined refining and dewaxing an impurity-containing edible oil, said method comprising the steps of:

(a) forming a stream of from about 70 to about 99.9 wt. % of an impurity-containing edible oil and from about 0.1 to about 30 wt. % of a 0.01 to 6.5 Normal aqueous alkali solution;

(b) driving the stream through an interfacial surface mixer at a temperature of from about 3° C. to about 60° C. so as to generate a mean droplet size in the alkali solution sufficiently small to mix with the oil, and to react with and remove the impurities therein, without forming an emulsion; and

(c) separating the purified oil from the alkali solution after step (b).

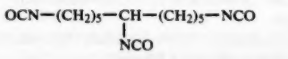
4,276,228

1,6,11-UNDECANE TRIISOCYANATE

Masaki Nishino, Kawasaki, and Yutaka Yasuhara, Nagoya, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jun. 12, 1979, Ser. No. 47,737
Claims priority, application Japan, Jun. 19, 1978, 53-73196
Int. Cl.[3] C07C *119/042*
U.S. Cl. 260—453 AL 1 Claim

1. 1,6,11-undecane triisocyanate represented by following formula,



(I)

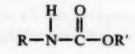
4,276,229

PROCESS FOR PREPARING CARBAMATE COMPOUNDS

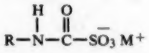
Young-Jin Lee, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 25, 1980, Ser. No. 133,789
Int. Cl.[3] C07C *119/06, 131/00*
U.S. Cl. 260—453 RW 8 Claims

1. A process for preparing a compound of the formula:



which comprises reacting a compound of the formula:



with an active hydrogen containing compound containing an organic radical, in the presence of a base, wherein:

M is an alkali metal or ammonium ion;

R is a C_1–C_8 alkyl or phenyl group; and,

R′ is an organic radical from the active hydrogen containing compound, and wherein said active hydrogen containing compound is selected from the group consisting of an aliphatic alcohol, an aromatic aliphatic alcohol, a phenolic compound, a thiol compound, a secondary or primary amine, or an oxime.

4,276,230

CYANO-3-PHENOXYBENZYL N-1-(1-NAPHTHYL) ETHYLCARBAMATE

Richard J. Anderson, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Filed Apr. 21, 1980, Ser. No. 142,518
Int. Cl.[3] C07C *121/75, 121/78*
U.S. Cl. 260—465 D 4 Claims

1. The compound, α-cyano-3-phenoxybenzyl N-1-(1-naphthyl)ethylcarbamate.

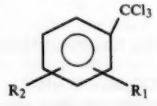
4,276,231

PROCESS FOR THE PREPARATION OF OPTIONALLY SUBSTITUTED BENZOYL CHLORIDE

Walter Böckmann; Karl-August Lipper, and Friedrich Brühne, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 4, 1979, Ser. No. 71,805
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1978, 2841541
Int. Cl.[3] C07C *51/60, 51/58*
U.S. Cl. 260—544 D 22 Claims

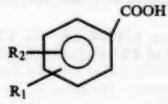
1. In a process for the preparation of optionally substituted benzoyl chloride from optionally substituted benzotrichloride which process is performed at elevated temperature in the presence of a catalyst the improvement consisting essentially of reacting an optionally substituted benzotrichloride having the general formula



wherein R_1 and R_2 are identical or different and represent hydrogen, halogen, nitro or alkyl,

or a mixture of said optionally substituted benzotrichloride and optionally substituted benzoyl chloride with a 1 to 20 mol percent excess, based on said optionally substituted benzotri-

chloride employed, of optionally substituted benzoic acid of the general formula



wherein R_1 and R_2 can be identical or different and represent hydrogen, halogen, nitro or alkyl,

and/or liquid water, the hydrogen chloride containing off-gases formed during the reaction being washed with the optionally substituted benzotrichloride employed or the mixture of optionally substituted benzotrichloride and optionally substituted benzoyl chloride employed and/or with an inert, optionally substituted aliphatic, cycloaliphatic, and/or aromatic hydrocarbon having up to 15 carbon atoms, the reaction mixture being subjected to distillation and the bottom product which remains after distillation of optionally substituted benzoyl chloride being reacted with a 3 to 150% molar excess of optionally substituted benzotrichloride, based on the amount of optionally substituted benzoic acid present in the bottom product, and the mixture of optionally substituted benzotrichloride and optionally substituted benzoyl chloride which is obtained therefrom after distillation being recycled as feed product into the main reaction.

4,276,232

PHOSPHORUS STABILIZERS

Michael Rasberger, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 922,392, Jul. 6, 1978, abandoned. This application Oct. 9, 1979, Ser. No. 82,499

Claims priority, application Switzerland, Jul. 7, 1977, 8431/77

Int. Cl.³ C07F *9/48*

U.S. Cl. 260—936 **1 Claim**

1. 6-(2,4-di-tert.-octyl-phenoxy)-dibenz[c,e]-[1,2]oxaphosphorine.

4,276,233

HINDERED PHENOL PHOSPHITES

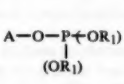
Ronald L. Markezich; Walter K. Olander, both of Mt. Vernon, Ind., and Robert J. Axelrod, Glenmont, N.Y., assignors to General Electric Company, Mt. Vernon, Ind.

Division of Ser. No. 957,430, Nov. 2, 1978. This application Jul. 16, 1979, Ser. No. 57,999

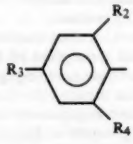
Int. Cl.³ C07F *9/141*; C08K *5/52*

U.S. Cl. 260—937 **14 Claims**

1. A phosphite compound represented by the general structure:

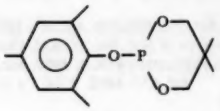


wherein R_1 can independently be an alkyl of about C_1–C_{30}; and alkyls of C_2–C_{20} which can form cyclic structures; and, A is a hindered phenol represented by the general structure:



wherein R_2, R_3 and R_4 can be the same or different and each can independently be hydrogen, halogen or C_1–C_4 alkyl provided that neither R_2 and/or R_4 are both hydrogen.

12. A phosphite compound having the structure:



4,276,234

PROCESS FOR PREPARING PENTAERITHRITOL METHYLPHOSPHONATES HAVING AT LEAST ONE HYDROXYL GROUP OF PENTAERITHRITOL UNESTERIFIED

Milton L. Honig, Bronx, and Edward D. Weil, Hastings-on-Hudson, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 973,282, Dec. 26, 1978, Pat. No. 4,207,271, which is a division of Ser. No. 615,321, Sep. 25, 1975, Pat. No. 4,152,373. This application Sep. 6, 1979, Ser. No. 72,966

Int. Cl.³ C07F *9/40*

U.S. Cl. 260—982 **1 Claim**

1. A method of preparing a composition comprising a methyl phosphonate derivative of pentaerythritol having at least one hydroxyl group of pentaerythritol unesterified comprising transesterifying pentaerythritol with a diaryl methyl phosphonate at a temperature ranging from about 170° C. to about 250° C. and in the presence of a catalyst selected from the group consisting of methyl iodide, magnesium chloride and aluminum trichloride.

4,276,235

METHOD FOR PURIFYING BIDENTATE ORGANOPHOSPHOROUS COMPOUNDS

Lyle D. McIsaac, Blackfoot; Joseph F. Krupa, Idaho Falls, and Norman C. Schroeder, Pocatello, all of Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 24, 1980, Ser. No. 143,381

Int. Cl.³ C07F *9/40*; C01G *56/00*

U.S. Cl. 260—990 **5 Claims**

1. A method for removing impurities present in bidentate organophosphorous compounds comprising: dissolving the bidentate compound in a water-immiscible organic solvent to form a solvent solution containing up to 30 volume percent of the bidentate compound, the organic solvent being one in which the mercuric bidentate compound to be formed is insoluble and which is selected from the group consisting of aliphatic hydrocarbons of five or more carbon atoms and cyclic aliphatic hydrocarbons, contacting the solvent solution at a temperature of up to 40° C. with an aqueous nitric acid solution of mercuric nitrate containing sufficient mercuric ion and for a period of time sufficient from the mercuric ion to react with the bidentate compound to form an insoluble mercuric bidentate compound, which precipitates while the impurities remain in solution, separating the precipitate from the aqueous and the organic solutions, contacting the precipitate with a bidentate recovery solution, the recovery solution being a mixture of an aqueous solution of a strong mercuric ion complexing agent selected from the group consisting of potassium cyanide and cysteine and a water-immiscible organic solvent selected from the group consisting of aliphatic hydrocarbons of five or more carbon atoms and cyclic aliphatic hydrocarbons, whereby the mercuric ion is complexed from the insoluble mercuric bidentate compound reforming the soluble bidentate compound which dissolves in the organic solvent, separating the organic solvent from the aqueous solution, and recovering the purified bidentate solution.

4,276,236

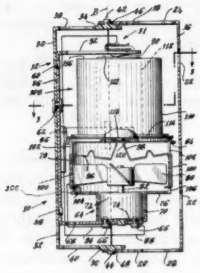
APPARATUS FOR INDUCING AIR FLOW PAST A PRODUCT CAPABLE OF BEING VAPORIZED

William E. Sullivan, and Murray O. Meetze, Jr., both of Columbia, S.C., assignors to Risdon Enterprises, Inc., Columbia, S.C.

Continuation of Ser. No. 900,820, Apr. 27, 1978, abandoned, which is a division of Ser. No. 732,137, Oct. 13, 1976, abandoned. This application Feb. 4, 1980, Ser. No. 117,827

Int. Cl.[3] A61L 9/04

U.S. Cl. 261—30 23 Claims



1. Improved means for mounting a cartridge, which carries a product capable of being vaporized and a battery and is used in conjunction with apparatus including battery-powered means operative to induce air flow past said product when said cartridge is mounted on said mounting means; said improved cartridge mounting means supporting said cartridge, connecting one terminal of said battery to said battery-powered means, and comprising:

A. support means including

1. a tubular member
2. flange means projecting radially from one margin of said tubular member for receiving and supporting said cartridge, and
3. a partially cylindrical wall extending axially from said flange means for positioning said cartridge when received and supported on said flange means, and

B. a contact member formed of resilient yet torsion resistant conductive wire having

1. a first section spanning said tubular member at said one margin;
2. a projection from said first section for contacting said one terminal of said battery when said cartridge is received and supported on said flange means; and
2. at least one anchor length extending along the side wall of said tubular member and being secured thereto at at least two spaced locations whereby bending of said projection is resisted by said anchor length and whereby said contact presents minimal obstruction to flow through said tubular member and said cartridge.

4,276,237

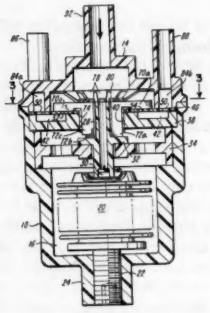
CARBURETOR AIR CONTROL DEVICE

Glenn B. Barker, Lincoln, and William K. Coburn, III, Sudbury, both of Mass., assignors to Standard-Thomson Corporation, Waltham, Mass.

Filed Aug. 1, 1979, Ser. No. 62,807

Int. Cl.[3] F02M 7/24

U.S. Cl. 261—39 A 7 Claims



1. Carburetor air control mechanism for control of air flow to a plurality of ports of a carburetor comprising:

a housing provided with a first portion and a second portion,

an enclosed bellows member within the first portion of the housing, the bellows member having a pressure therewithin which is less than sea level atmospheric pressure, the bellows member being expansible in length when subjected to an atmosphere having density less than a given density,

the second portion of the housing having an air inlet conduit and a plurality of air outlet conduits, each air outlet conduit being adapted to communicate with a port of a carburetor,

an actuator rod axially movable by the bellows member upon expansion and contraction of the bellows member,

an engagement element carried by the actuator rod for movement therewith,

an orifice plate provided with a first group of orifices therethrough and a second group of orifices therethrough,

a channel plate in juxtaposition with the orifice plate, the channel plate having a plurality of channels, each channel being in communication with an orifice of the first group of orifices and also in communication with an orifice of the second group of orifices, each of the orifices of the first group of orifices being in communication with one of the air outlet conduits, some of the orifices of the first group being in communication with one of the air outlet conduits and some of the orifices of the first group of orifices being in communication with another of the air outlet conduits,

a plurality of closure members, each of the closure members normally covering and closing an orifice of the second group of orifices of the orifice plate, each closure member having a stem extending therefrom and engageable by the engagement element with movement of the actuator rod for movement of the closure member from the orifice plate to open the respective orifice, each orifice of the second group of orifices when open being in communication with the air inlet conduit,

expansion of the bellows member causing axial movement of the actuator rod and movement of the engagement element, the engagement element engaging the stems of the closure members and moving the stems and moving the closure members from engagement with the orifice plate to open the second group of orifices for flow of air therethrough from the air inlet conduit, air flowing through each of the second group of orifices also flowing through

a channel of the channel plate and through an orifice of the first group of orifices and to one of the air outlet conduits.

4,276,238

CARBURETOR WITH AUTOMATIC CHOKING AND ACCELERATION DEVICE

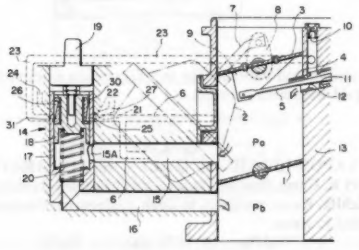
Katsushi Yoshikawa, Yokohama; Masaaki Saito, Yokosuka; Tadaki Ota, and Mitsumasa Inoue, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 12, 1979, Ser. No. 84,156

Claims priority, application Japan, Oct. 19, 1978, 53-128853; Oct. 23, 1978, 53-145569[U]

Int. Cl.³ F02M *1/10*

U.S. Cl. 261—39 D **7 Claims**



1. A carburetor comprising:

a mixture passage;

a throttle valve positioned in the mixture passage;

a variable venturi valve postioned in the mixture passage upstream of the throttle valve;

a vacuum-driven actuator which is controlled by the vacuum in the mixture passage between the throttle valve and the variable venturi valve, and which controls the opening of the variable venturi valve so as to keep said vacuum approximately constant;

a variable fuel supplier responsive to the amount of opening of said variable venturi valve, for supplying fuel into said mixture passage and for increasing fuel flow rate approximately in direct proportion to the said amount of opening;

a bypass passage which bypasses the throttle valve in the mixture passage, leading from upstream of the throttle valve to downstream of the throttle valve;

a piston, which is biased in a first direction by a spring, and which is urged in the direction opposite to said first direction by the vacuum downstream of the throttle valve, and whose motion in the said opposite direction progressively intercepts the bypass passage, so that by said piston reaching an equilibrium position determined by the balance of said biasing and said urging, said piston comprises means for adjusting the flow resistance of the bypass passage;

a heat-sensitive element which responds to a temperature which is representative of the temperature of the engine, and which when the engine is in the cold state does not affect the positioning of the piston, but which, as the engine warms up, gradually advances the extreme possible position of the piston in said first direction in said opposite direction, and which, when the engine is fully warmed up, advances the extreme possible position of the piston in said first direction so far in said opposite direction that said piston substantially closes the bypass passage; and

means, associated with said piston, for regulating the flow of air to be fed into the fuel supplier to mix with the fuel supplied thereby in an amount which varies from a minimum when said vacuum downstream of the throttle valve is minimum, to a maximum when said vacuum is maximum, and reversely regulating the flow of air fed into the vacuum-driven actuator.

4,276,239

VARIABLE AIR VALVE CARBURETOR

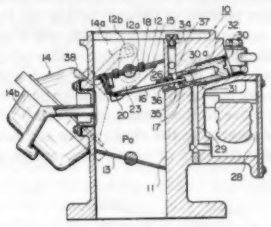
Katsushi Yoshikawa, Yokohama; Masaaki Saito, Yokosuka; Tadaki Ota, and Mitsumasa Inoue, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 19, 1979, Ser. No. 86,312

Claims priority, application Japan, Oct. 19, 1978, 53-128857

Int. Cl.³ F02M *7/22*

U.S. Cl. 261—44 E **13 Claims**



1. A carburetor for an internal combustion engine, comprising:

a body;

an intake passage formed in the body, circular in cross-section, leading to the engine;

a circular throttle valve mounted rotatably in the intake passage about one of its diameters;

a circular air valve mounted upstream of the throttle valve rotatably in the intake passage about one of its diameters,

means for controlling said air valve in response to vacuum between said air valve and the throttle valve, so as to maintain that vacuum substantially constant;

a fuel nozzle opening into the intake passage between the throttle valve and the air valve; and

a tapered needle having two ends, one end of which is inserted into the fuel nozzle so that it co-operates with the nozzle to provide a fuel opening which is varied in effective cross-section, as it moves in and out of the nozzle; and means fixed to the back of the air valve for pivotally supporting the other end of the needle, said supporting means including:

a bracket having a space therein, the bracket being fixed at a first portion away from said throttle valve to the side of the air valve closest to said throttle valve and having a slot formed in a second portion of the bracket closest to said throttle valve;

a joint pin having two ends passing laterally through the second portion of the bracket and connected pivotally at its center to said other end of the needle, each end of the joint pin being set in the slot of the bracket; and

a spring biasing the joint pin toward a rearmost position of the slot.

4,276,240

CARBURETOR

Gerald B. Bishop, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

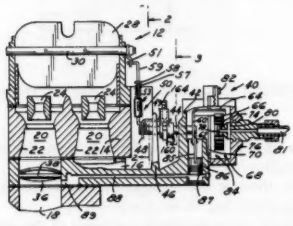
Filed Dec. 21, 1979, Ser. No. 106,114

Int. Cl.³ F02M *1/10*

U.S. Cl. 261—52 **3 Claims**

1. A carburetor having an air/fuel induction passage open at one end to air at essentially atmospheric pressure and connected at its opposite end to an engine intake manifold to be subject to the changing vacuum levels therein, the one end having a choke valve rotatably mounted for movement across the passage between a closed air choking position and open inoperative position, and a throttle valve rotatably mounted posterior of the choke valve for movement across the passage between a normal essentially closed engine idle speed position

and beyond towards a wide open throttle position to control the quantity of air/fuel mixture flow through the passage. an abutment means rotatable with the throttle valve, a rotatable fast idle cam having a high cam step projecting radially from the cam axes for engagement at times by the abutment means during movement of the throttle valve in a closing direction to stop the throttle valve in a more open position than the idle speed position to increase mixture flow to the manifold, the cam also having a second cam step of lesser radial projection engagable with the abutment means at other times as a function of the rotative position of the cam to stop the throttle valve in a less open position than the high cam step position but more open than the idle speed position, the cam being rotatable by gravity towards an inoperative position upon disengagement of the abutment means with the cam steps permitting closure of the throttle valve to the normal idle speed position, rotatable lever means secured to the choke valve and having a portion extending into the path of rotative movement of the fast idle



cam towards the inoperative position to stop the cam rotation, a shaft, means rotatably mounting the fast idle cam on the shaft, means pivotally connecting the lever means to the choke valve, and means securing the shaft to the lever means and to a thermostatically responsive spring means urging the shaft and lever means in a choke closing direction upon decreases in temperature below the normal engine operating temperature level to abut the lever means portion with the fast idle cam and permit repositioning of the fast idle cam to a more open throttle valve position, the means connecting the lever means to the choke valve including lost motion means providing concurrent movement of the lever means and choke valve in a choke valve closing direction until the choke valve reaches its closed position and the fast idle cam second step is positioned to engage the abutment means, the lost motion means permitting subsequent relative movement between the lever means and choke valve to permit a rotation of the fast idle cam to engage the abutment means with the high cam step without necessitating a corresponding rotation of the choke valve.

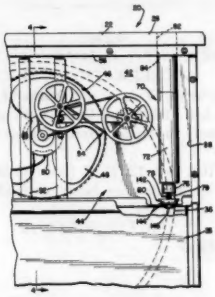
4,276,241

DISPENSER-LIQUID WATER TREATMENT FOR ROOM HUMIDIFIER

Richard F. Stewart, North Brunswick, and Robert W. Kennedy, Bridgewater, both of N.J., assignors to White-Westinghouse Corporation, Pittsburgh, Pa.

Filed Jun. 29, 1978, Ser. No. 920,460
Int. Cl.³ B01F 3/04
U.S. Cl. 261—92 **16 Claims**

1. In combination in a humidifier having a water supply reservoir: a refillable, removable auxiliary liquid treatment container with a removable closure means at its outlet end removably mounted in the humidifier in inverted position with its outlet end disposed for controlled flow communication into the water reservoir, a normally closed valve means located in the closure means of said container including an operable means enabling controlled manipulation of said valve means



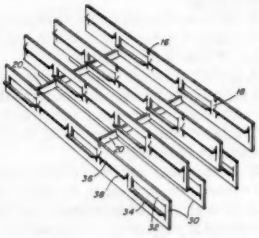
for opening said valve means and dispensing a desired amount of liquid treatment material.

4,276,242

VAPOR-LIQUID CONTACT GRID APPARATUS

Gilbert K. Chen; Paul M. Nyberg, and Matthew Buchholz, all of Wichita, Kans., assignors to Koch Engineering Company, Inc., Wichita, Kans.

Filed Nov. 19, 1979, Ser. No. 95,296
Int. Cl.³ B01D 3/22; B32B 3/10
U.S. Cl. 261—111 **9 Claims**



1. A vapor-liquid contact apparatus which comprises a plurality of transverse layers positioned generally one above the other, with each of the layers comprising grid members and connectors:

(a) the grid members positioned in a generally vertical, upright and generally parallel, spaced-apart relationship defining a vapor passageway between the upright grid members,

(i) the grid members composed of a thin, upright grid element, and

(ii) generally transverse vanes derived from the grid member and extending transversely outwardly into the vapor passageway from the upright grid members,

(iii) vanes being paired into sections so that the vanes are positioned one above the other along the longitudinal length of the grid member, at least one vane extending outwardly from one side and at least one vane extending outwardly from the other side, and the vanes of each section separated by a rib element formed of the grid element, the vanes generally of a significantly greater longitudinal portion of the grid member than the rib elements therebetween, and

(iv) the grid elements further characterized by a plurality of open slots extending inwardly a short distance from each outer edge thereof;

(b) connectors composed of thin, upright strip elements, the

connectors positioned in a generally vertical, spaced-apart, and parallel relationship in each layer, and adapted to have the edges positioned in the open slots of the grid elements, thus forming a grid layer of the vapor-liquid contact apparatus and thereby providing improved vapor-liquid contact.

4,276,243

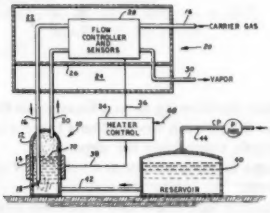
VAPOR DELIVERY CONTROL SYSTEM AND METHOD

Fred P. Partus, Cobbs County, Ga., assignor to Western Electric Company, Inc., New York, N.Y.

Continuation of Ser. No. 967,806, Dec. 8, 1978, abandoned. This application Apr. 4, 1980, Ser. No. 137,148

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—128 **9 Claims**



1. A method of linearly controlling mass flow rates of delivery of vapor from a bubbler containing a supply of liquid through which a carrier gas is bubbled at preselected, mutually-diverse flow rates in which vapor pressure is not in steady state and from which bubbler vapor is delivered in a vapor stream entrained with the carrier gas, and with the method comprising the steps of sensing the ratio of vapor to carrier gas in the vapor stream and applying heat to the liquid within the bubbler at rates in direct relationship to the sensed ratios of vapor to carrier gas being delivered from the bubbler in the vapor stream to hold said ratio constant.

5. A vapor delivery control system comprising a vaporizer; a heater thermally coupled with said vaporizer; means for maintaining a supply of liquid in said vaporizer; means for introducing a carrier gas into said vaporizer; means for conducting the carrier gas and vapors of the liquid entrained with the carrier gas from said vaporizer; means for sensing the ratio of vapor to carrier gas being conducted from said vaporizer; and means for controlling said heater directly responsive to ratios of vapor to carrier gas sensed by said sensing means, said controlling means including means for applying heat to the liquid in the vaporizer at rates in direct relationship to said sensed ratios to hold said ratio constant.

4,276,244

PACKING OF EQUIPMENT FOR THE PURPOSE OF CONTACTING MAINLY GASEOUS AND LIQUID MEDIUMS

Fabry György, and Istvan Takacs, both of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

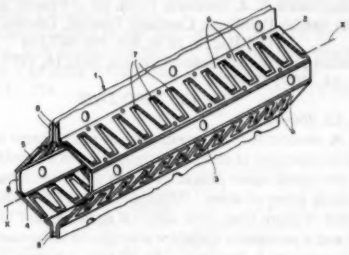
Division of Ser. No. 892,258, Mar. 31, 1978, Pat. No. 4,215,083. This application Sep. 12, 1979, Ser. No. 74,779

Claims priority, application Hungary, Apr. 27, 1977, RI 628

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—155 **9 Claims**

1. A column or tower packing adapted to be traversed by at least one fluid which comprises a stack of superposed layers of mutually parallel channels with the channels of one layer extending transversely to the channels comprising a pair of walls inclined to one another and joined by an imperforate third wall to form a small base and diverging legs of a trapezoidal profile of the channel, the walls of each pair being dentate and formed with a multiplicity of spaced-apart vibratile elements interdigitating with but spaced from corresponding vibratile elements reaching in opposite direction to the first mentioned vibratile elements on the respective wall, said elements being dimensioned to be set into vibration by the passage of said fluid through the packing, each of said layers having a corrugated profile corresponding to a respective series of trapezoidal profiles of the respective channels.



4,276,245

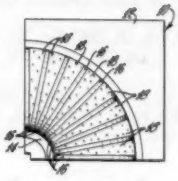
METHOD OF MAKING AND USING MOLDS FOR LONGITUDINALLY CURVED SECTIONS OF PIPE INSULATION

Russell L. Ault, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 22, 1979, Ser. No. 68,808

Int. Cl.³ B29D *27/04*

U.S. Cl. 264—46.5 **1 Claim**



1. A method of making a longitudinally curved section of foamed resin pipe insulation having a glass fiber reinforced resin outer jacket, the method comprising making a first mold by mounting a plurality of flat, semicircular ribs of a relatively large radius in an arcuate pattern and in arcuately aligned, spaced relationship on a first board with each rib having a diametral portion of its periphery facing the board and extending generally radially of the arcuate pattern, and foaming a foamable, hardenable liquid resin in place between each pair of adjacent ribs to provide foam segments between the ribs, making a second mold by mounting a plurality of flat, semicircular ribs of a relatively small radius in an arcuate pattern and in arcuately aligned, spaced relationship on a second board with each rib having a diametral portion of its periphery facing the board and extending generally radially of the arcuate pattern, and foaming a foamable, hardenable liquid resin in place between each pair of adjacent ribs to provide foam segments between the ribs, forming a glass fiber reinforced resin outer jacket on the first mold, removing the outer jacket from the first mold, placing the outer jacket in juxtaposition with the second mold, foaming a foamable, hardenable liquid resin in place between the outer jacket and the second mold to produce a longitudinally curved section of foamed resin pipe insulation having the glass fiber reinforced resin outer jacket adhered thereto, and removing the pipe insulation with the outer jacket from the second mold.

4,276,246
PROCESS FOR PREPARING PITCH FOAMS AND PRODUCTS SO PRODUCED

Albert Bonzom, Sausset-les-Pins; Alain P. Crepaux, Lavera, and Anne-Marie E. J. Moutard, Paris, all of France, assignors to The British Petroleum Company Limited, London, England

Filed Dec. 8, 1978, Ser. No. 967,594
Claims priority, application France, Dec. 14, 1977, 77 37747; Dec. 14, 1977, 77 37748
Int. Cl.³ B29D *27/00*
U.S. Cl. 264—53 **5 Claims**

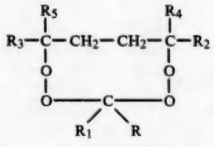
1. A process for the production of pitch foams in which a pitch is expanded at elevated temperature in a mould by means of a porogenic agent characterised in that a pitch having a KS softening point of from 150° to 210° C., a Conradson carbon content of more than 50%, and a β resin content of from 5 to 40% and a porogenic agent are introduced into a mold that the initial pressure is between 1 to 10 bars wherein the applied external pressure is higher than the internal pressure which would normally exist within the pitch at the temperature of operation, and that after the decomposition of the porogenic agent, the external pressure is lowered to a decompression pressure to expand the pitch in the mold to a density of from 0.05 to 0.6 and an open porosity of greater than 75% during a decompression stage, the decompression pressure being between 0 and 2 bars, the pitch having a viscosity of from 1,000 to 10,000 Pa.s during the decompression stage, and that thereafter the expanded pitch foam is released from the mold.

4,276,247
CYCLIC PEROXYKETAL CROSS-LINKING/BLOWING AGENTS FOR POLYETHYLENE

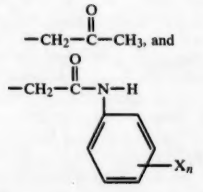
John R. Muenchow, Richmond; Ronald L. Pastorino, Larkspur; Reidar Halle, Novato, and Roger N. Lewis, Martinez, all of Calif., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Feb. 19, 1980, Ser. No. 122,229
Int. Cl.³ C08J *9/06*
U.S. Cl. 264—54 **9 Claims**

1. A method for making foamed, crosslinked polyethylene comprising: mixing polyethylene with about 0.10–10% by weight of a crosslinking/blowing agent of the formula:



wherein each of R_2, R_3, R_4 and R_5 is selected from alkyl having from 1–4 carbon atoms; each of R and R_1 is selected from alkyl, hydroxy alkyl and alkyl carboxylate ester groups having up to about 10 carbon atoms,

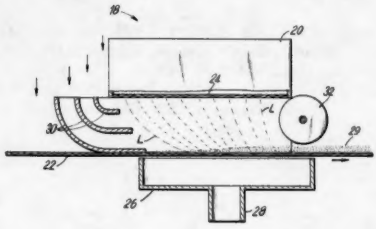


where n=0 to 3 and X is lower alkyl or alkoxy of up to about 5 carbon atoms; and heating said mixture to a temperature sufficient to crosslink and foam said polyethylene under conditions which permit expansion of the polyethylene.

4,276,248
METHODS FOR FORMING FIBROUS WEBS

Sheila E. Widnall, Lexington, Mass., assignor to American Can Company, Greenwich, Conn.

Filed Oct. 31, 1979, Ser. No. 89,925
Int. Cl.³ D04H *1/00*
U.S. Cl. 264—121 **9 Claims**

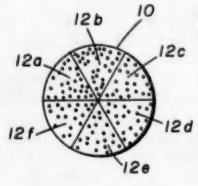


1. A method for forming upon a foraminous forming surface a nonwoven fibrous web having fibers therein less than about ¼ inch in length, comprising the steps of:
(a) moving a forming surface at a velocity V_0 exceeding 500 ft./minute;
(b) distributing said fibers into a gaseous stream to form a suspension therein;
(c) conveying the gaseous suspension of fibers in a stream at an angle to said moving surface, said gaseous stream of fibers having a first velocity component V_1 parallel to the direction of motion of said moving surface, and a second velocity component V_2 normal to the direction of motion of said moving surface;
(d) establishing conditions wherein the ratio of the absolute value of V_0–V_1, relative to V_2, is less than about three, and;
(e) depositing said fibers in said gaseous stream upon said foraminous moving surface to form said nonwoven fibrous web.

4,276,249
PROCESSES FOR SEALING HOLLOW FIBER MEMBRANES ARRANGED IN THE FORM OF A BUNDLE

Harry P. Holladay, Raleigh, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 26, 1979, Ser. No. 78,873
Int. Cl.³ B32B *21/00*
U.S. Cl. 264—139 **22 Claims**



1. In a process for sealing the bores of a plurality of hollow fiber membranes comprised of thermoplastic material, which hollow fiber membranes are arranged in the form of a bundle, comprising subjecting an end of the bundle, which end is transverse to the orientation of the hollow fiber membranes, to sufficient heat to melt the ends of the hollow fiber membranes in order to cause hollow fiber membranes to adhere at the end of the bundle to adjacent hollow fiber membranes, the im-

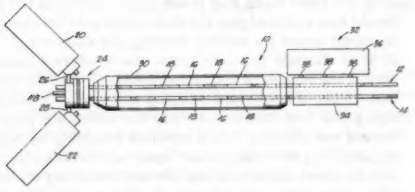
provement comprising placing a substantially non-sealing insert member within and at the end of the bundle prior to and during subjecting the end of the bundle to the heat whereby said substantially non-sealing insert member provides a boundary to the adhering of hollow fiber membranes and results in passageways being provided through the end of the bundle.

4,276,250

APPARATUS AND METHOD FOR PRODUCING TUBULAR EXTRUSIONS HAVING AXIAL SECTIONS OF MATERIALS HAVING DIFFERENT CHARACTERISTICS

Fred E. Satchell, Chesterfield, and Joel A. Joslin, Sunset Hills, both of Mo., assignors to Sherwood Medical Industries, Inc., St. Louis, Mo.

Filed Oct. 29, 1979, Ser. No. 89,567
Int. Cl.³ B29D *23/04*
U.S. Cl. 264—167 **15 Claims**



7. Apparatus for substantially simultaneously extruding first and second plastic tubes, each plastic tube having alternate axial sections of plastic material having different characteristics; said apparatus comprising:

first and second die means;

first and second extruders for feeding plastic material to said first and second die means;

first valve means operatively associated with said first extruder for delivering plastic material from said first extruder to either said first die means or said second die means, and second valve means operatively associated with said second extruder for delivering plastic material from said second extruder to either said second die means or said first die means; and

said first and second valve means being operable so that when said first valve means is directing plastic material from said first extruder to said first die means said second valve means is directing plastic material from said second extruder to said second die means, and when said first valve means is directing plastic material from said first extruder to said second die means said second valve means is directing plastic material from said second extruder to said first die means.

12. A method for substantially simultaneously extruding first and second plastic tubes, each plastic tube having alternate axial sections of plastic material having different characteristics; said method comprising the steps of:

(1) feeding plastic material from a first material producing means to a first die means while substantially simultaneously feeding plastic material from a second material producing means to a second die means;

(2) thereafter feeding plastic material from the first material producing means to the second die means while substantially simultaneously feeding plastic material from the second material producing means to the first die means; and

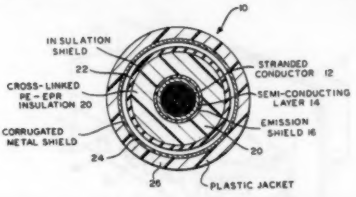
(3) repeating steps (1) and (2) to produce two plastic tubes, each having alternate axial sections of plastic material fed from the first and second material producing means.

4,276,251

POWER AND CONTROL CABLES HAVING FLEXIBLE POLYOLEFIN INSULATION

Louis A. Bopp, Long Branch, N.J., assignor to General Cable Corporation, Greenwich, Conn.

Continuation-in-part of Ser. No. 760,017, Jan. 17, 1977, abandoned. This application Sep. 22, 1978, Ser. No. 944,983
Int. Cl.³ B29F *3/10*; B29H *9/10*; B29C *27/24*
U.S. Cl. 264—174 **8 Claims**



1. The method of making a layer of insulation for an electric power cable which comprises mixing together pellets of polyethylene and ethylene propylene copolymer, antioxidant and cross-linking agent in which the ingredients are mixed non-homogeneously, in a ribbon blender in the absence of any mineral reinforcing filler in the ribbon blender, then introducing the blended polymer ingredients and the anti-oxidant and cross-linking agents into an extruder housing having a feed screw in the extruder housing as the ingredients are advanced through said extruder housing by the feed screw, simultaneously homogenizing and extruding the ingredients to coat an electrical conductor with the mixture of polyethylene, and the copolymer of ethylene and propylene, said copolymer being approximately 15% crystalline, and containing no filler that increases the physical properties of the insulation, adding to said copolymer polyethylene to supply additional crystallinity to the insulation, the polyethylene forming with said ethylene-propylene copolymer, a polymer system having electrical characteristics substantially equal to those of polyethylene and having improved physical characteristics of greater toughness than the copolymer, and greater flexibility than polyethylene.

4,276,252

ADDITION OF SI-BONDED HYDROGEN TO AN ALIPHATIC MULTIPLE BOND

Gerhard Kreis, Munich, and Karl-Heinrich Wegehaupt, Burghausen, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 17, 1979, Ser. No. 85,572
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1978, 2846621
Int. Cl.³ B29C *1/02*
U.S. Cl. 264—222 **10 Claims**

10. An improved method for making dental impressions which comprises applying a composition containing an organopolysiloxane having alkenyl groups, an organopolysiloxane containing Si-bonded hydrogen and a platinum catalyst to a tooth and thereafter removing the crosslinked organopolysiloxane impression, the improvement which comprises adding a platinum catalyst selected from the group consisting of complexes of the formula

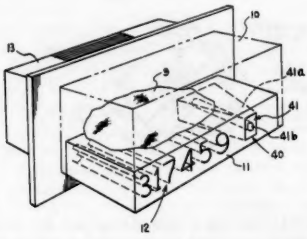
$$(R^1)PtX_2 \text{ and } (R_2SO)(Z)PtY_2$$

where R is selected from the group consisting of hydrocarbon radicals and substituted hydrocarbon radicals, R^1 is selected from the group consisting of cyclic hydrocarbon radicals and substituted cyclic hydrocarbon radicals having two aliphatic carbon-carbon double bonds, X is selected from the group consisting of halogen atoms and alkyl radicals, Z is a hydrocarbon radical having a carbon-carbon double bond and Y is a halogen atom.

4,276,253
METHOD FOR HISTOLOGY SPECIMEN LABELLING

Stanford L. Adler, Sr., New Milford, Conn.; Abraham Gordon, Teaneck, N.J., and Leonard Ornstein, White Plains, N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Apr. 20, 1979, Ser. No. 31,714
Int. Cl.[3] B29C 6/02, 9/00
U.S. Cl. 264—247 7 Claims



1. A method of labelling a histological specimen, comprising the steps of:

(a) forming a plurality of elongated labelling elements, said labelling elements being preformed and at least the length of said specimen, said labelling elements being formed of a first material which is compatible with the subsequent fixing, dehydrating and embedding media used in the subsequent processing of said specimen and easily sectioned by a microtome,

(b) orienting said specimen and said labelling elements within a mold in respect to a chosen sectioning plane of said specimen, said labelling elements being oriented to be at least co-extensive with portions of said specimen to be sectioned in a direction vertical to said sectioning plane,

(c) filling said mold with an embedding medium,

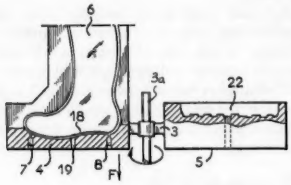
(d) allowing said embedding medium to set, and

(e) removing said set embedding medium from said mold for subsequent positioning on a microtome for sectioning of said specimen and labelling elements.

4,276,254
PROCESS AND MOLD FOR PRODUCING SAFETY FOOTWEAR

Roger Combronde, Chabreloche, France, assignor to Plastic Auvergne, Chabreloche, France

Filed Dec. 13, 1979, Ser. No. 103,139
Claims priority, application France, Dec. 22, 1978, 78 36261
Int. Cl.[3] B29D 3/02; B32B 15/08
U.S. Cl. 264—251 9 Claims



1. In a process for the injection moulding of safety footwear with the inclusion of a sheet metal sole embedded in an injected sole portion of the footwear, by means of an inner last, two openable lateral mould parts, a first mould base, a second mould base and means for bringing alternately the first mould base and the second mould base into a moulding position relative to the last and the two lateral mould parts for injection moulding the footwear said two lateral mould parts and first mould base and second mould base having mould cavities which define with the last a space for receiving a moulding material, said process comprising inserting said sheet metal sole between an inner sole and an outer sole of the footwear; the improvement comprising the steps of:

forming abutment means in the mould cavity of the first mould base adjacent two ends of the mould cavity of the first mould corresponding to toe and heel ends of the footwear, the abutment means having sheet metal sole engaging surfaces which have given shapes and are spaced a given distance apart;

taking a sheet metal sole having resilience and defining two abutment means engaging surfaces of given shapes at opposite ends of the sheet metal sole which surfaces are spaced apart a distance sufficiently greater than said given distance whereby a slight resilient bending of the sheet metal sole is necessary in order to engage the sheet metal sole between the abutment means, said given shapes of the abutment means and the abutment means engaging surfaces being respectively such as to interlock transversely of the sheet metal sole;

placing the sheet metal sole in the mould cavity of the first mould base and wedging the sheet metal sole between the abutment means by suitably bending the sheet metal sole so as to maintain the sheet metal sole in correct position against the bottom of the mould cavity of the first mould base by the effect of said wedging and said interlocking;

bringing the first mould base into the moulding position thereof and effecting a first injection moulding by injecting moulding material into said space and between the last and the sheet metal sole and thereby moulding an inner sole;

allowing the moulding material to substantially set;

removing the first mould base from the sheet metal sole, which sheet metal sole remains adhered to the moulding material injected into said space and has a bare surface exposed;

bringing the second mould base into the moulding positions thereof and effecting a second injection moulding by injecting moulding material into the mould cavity of the second mould base between the second mould base and said bare surface of the sheet metal sole and thereby moulding an outer sole; and

removing the second mould base after the moulding material has substantially set.

5. An injection mould for producing by at least two successive injections a safety footwear with inclusion of a resilient sheet metal sole embedded in an injected sole portion of the footwear, said mould comprising an inner last, two openable lateral mould parts, a first mould base, a second mould base and means for bringing alternately the first mould base and the second mould base into a moulding position relative to the last and the two lateral mould parts for injection moulding the footwear, said lateral mould parts, said first mould base and second mould base having mould cavities which define with the last a space for receiving a moulding material, two finger members respectively slidably mounted in the mould cavity of the first mould base adjacent two opposed ends of the mould cavity of the first mould base corresponding to toe and heel ends of the footwear for engaging notches in opposed ends of the sheet metal sole and thereby locating the sheet metal sole longitudinally and transversely of the mould cavity of the first mould base, said finger members being spaced apart a distance less than the distance between said notches in the sheet metal sole so as to require light bending of the sheet metal sole in order to engage the sheet metal sole between the finger members whereby the sheet metal sole is frictionally retained by the finger members owing to the resilience of the sheet metal sole, and elastically yieldable means biasing the finger members outwardly of the first mould base, the finger members having such length as to be biased out of the mould cavity of the first mould base an extent exceeding the moulding material receiving space between the mould cavity of the first mould base and

the last whereby when the first mould base is brought to the moulding position thereof the last urges the finger members inwardly of the first mould base and the finger members frictionally bias adjacent end portions of the sheet metal sole against the first mould base.

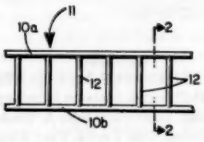
4,276,255
METHOD FOR THE STRETCHING OF FASTENERS

David B. Russell, Southborough, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Division of Ser. No. 721,774, Sep. 9, 1976, abandoned. This application Sep. 11, 1978, Ser. No. 941,083

Int. Cl.³ B29C *17/02*

U.S. Cl. 264—288.8 **3 Claims**



1. A method for continuously stretching fastener stock of the type having two longitudinally-extending side members integrally joined together at predetermined intervals by connectors transversely extending between them, the connectors being stretched without substantial permanent deformation of said side members, said method comprising:

(a) providing a pair of rotatable members each having a series of fixed peripheral projections defining therebetween a series of fixed notches spaced apart at said intervals and adapted to receive said connectors;

(b) rotating said members at substantially the same peripheral speed but in different planes to form an angled gap therebetween, the gap converging to a first portion no greater than the unstretched length of the connectors and diverging to a second portion substantially equal to the desired stretched length of the connectors;

(c) continuously feeding successive increments of said stock onto said rotating members at said first portion of the gap between them;

(d) engaging connectors of said stock in said notches at said first portion to advance the stock, and engaging a major portion of the length of the side members between said connectors on the outside of said projections during stretching;

(e) advancing said stock increments from the first to the second portion of the gap between the rotating members to stretch the connectors while the side members therebetween are supported against substantial deformation by said projections; and

(f) removing the stock from the rotating members.

4,276,256
METHOD FOR PREVENTING BACTERIAL PASSAGE INTO STERILE FLUID SYSTEMS

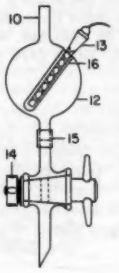
Narbik A. Karamian, 7609 Exeter Rd., Bethesda, Md. 20014

Continuation-in-part of Ser. No. 737,740, Nov. 1, 1976, abandoned. This application Jul. 21, 1978, Ser. No. 926,664

Int. Cl.³ A61L *2/10*

U.S. Cl. 422—24 **2 Claims**

1. A method of preventing microorganism contamination of a supply of sterile fluid stored in a reservoir, said reservoir comprising a vessel and outlet means for withdrawing fluid from said vessel, said outlet means comprising a quartz apparatus, by attaching an ultraviolet light source having a wavelength range of 2300 A° to 2900 A° at said quartz apparatus and intermittently exposing said quartz apparatus to an effective amount of ultraviolet light emitted from said light source, the



exposure intervals being of such duration that said stored fluid is maintained at substantially room temperature.

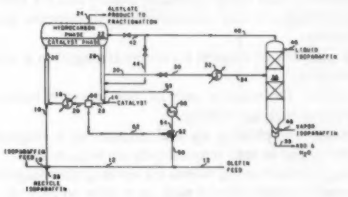
4,276,257
CATALYTIC ALKYLATION OF HYDROCARBONS

Rolland E. Dixon, and Charles C. Chapman, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 27,424, Apr. 5, 1979. This application May 1, 1980, Ser. No. 145,404

Int. Cl.³ C07C *3/54*; B01J *8/00*

U.S. Cl. 422—62 **6 Claims**



1. Apparatus for reacting an alkylatable hydrocarbon with an alkylating agent in the presence of a catalyst comprising:

alkylation reactor means;

separator-surge vessel means adapted to receive reactor effluent from said alkylation reactor and separate said reactor effluent into an alkylate product phase and a recycle catalyst phase;

conduit means for recycling said recycle catalyst phase to said alkylation rector;

cooling means mounted in said first conduit means;

detector means for determining the amount of acid-soluble oil in said separated catalyst phase;

heater means for heating at least an alkylating agent to a temperature above the alkylation reactor temperature;

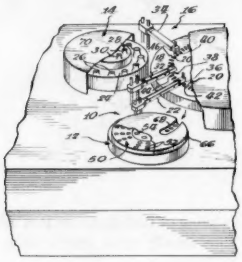
conduit means for passing effluent from said heater means to said first conduit means upstream of said cooler means; and

controller means for adjusting the amount of effluent from said heater means passed to said first conduit in response to said detected amount of catalyst-soluble oil in said catalyst phase.

4,276,258
SAMPLE AND STAT FEEDING SYSTEM AND SAMPLE TRAY

Guenter Ginsberg, Miami, and Bruce J. Hodgins, Hialeah, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Jan. 28, 1980, Ser. No. 115,924
Int. Cl.³ G01N *1/14, 35/06*
U.S. Cl. 422—64 **20 Claims**



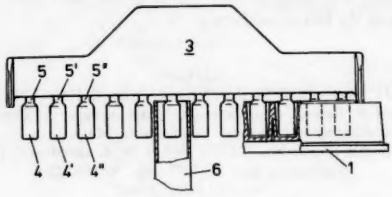
1. A feeding system for multiple discrete fluid samples comprising:
   A. at least one reaction vessel;
   B. a first tray assembly including a plurality of sequenced sample locations arranged in a first array, for containing liquid samples;
   C. at least one auxiliary sample location for containing auxiliary sample liquid, said auxiliary location positioned separate from said first array of sample locations;
   D. means for moving at least one of said sequenced and said auxiliary sample locations to a sample pick up station;
   E. means for picking up and dispensing an aliquot of liquid positioned at said sample pick up station;
   F. positioning means for moving said pick up and dispensing means to said sample pick up station and for then moving said aliquot to said reaction vessel to dispense said aliquot therein;
   G. a plurality of reagent locations arranged in a second tray assembly;
   H. means for moving one of said reagent locations to a reagent pick up station;
   I. means for picking up and dispensing a reagent aliquot positioned at said reagent pick up station and
   J. reagent positioning means for moving said reagent pick up means to said reagent pick up station to pick up said reagent aliquot and then moving said reagent pick up means to said reaction vessel to dispense said aliquot therein.

4,276,259
APPARATUS FOR PERFORMING A RADIOIMMUNOLOGICAL METHOD OF DETERMINING ANTIGENS OR ANTIBODIES

Johann Eibl, Vienna, and Helmut Aicher, Obersiebenbrunn, both of Austria, assignors to Immuno Aktiengesellschaft für chemisch-medizinische Produkte, Vienna, Austria

Division of Ser. No. 824,507, Aug. 15, 1977, abandoned. This application Aug. 24, 1978, Ser. No. 936,500
Claims priority, application Austria, Aug. 20, 1976, 6185/76
Int. Cl.³ G01N *33/56*
U.S. Cl. 422—71 **3 Claims**

1. In an arrangement for carrying out a radioimmunological method of determining antigens or antibodies of the type including a micro-titer-plate having recesses for accommodation of the samples to be examined and solid carriers loadable with a complex former, the improvement which is characterized in that the solid carriers are elongated plate-like elements and that a holding band is provided to which said elongated plate-like elements are secured, a neck piece of smaller cross section than the elongated elements is provided between the holding band and each elongated element to form pre-determined breaking



points, the elongated plate-like elements are insertable in the recesses of the micro-titer-plate.

4,276,260
FLUID TRANSFER MECHANISM

Vladimir J. Drbal, Hollywood; Guenter Ginsberg, Miami; Bruce J. Hodgins, Hialeah, all of Fla.; John A. Richardson, Shirley, Mass.; Ted W. Britton, Opa Locka, Fla.; Richard M. Grimm, Zolfo Springs, Fla.; Ernesto Bello, Miami Springs, Fla.; Rodolfo R. Rodriguez, Miami, Fla., and Ivan K. Saltz, Cooper City, Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Jan. 28, 1980, Ser. No. 115,691
Int. Cl.³ G01N *1/14*
U.S. Cl. 422—100 **19 Claims**

1. An improved pre-programmed multiple position fluid transfer mechanism comprising:
   A. an arm;
   B. shaft means movably coupled to a first end of said arm and having an axis;
   C. first drive means for moving said arm in translation relative to said shaft means and along said shaft means axis;
   D. second drive means for rotating said arm in an arcuate path around said shaft means axis; and
   E. probe means mounted on a second distal end of said arm including a fluid probe extending from said probe means and arm for picking up and dispensing fluids.

4,276,261
POLYMERIZATION APPARATUS AND PROCESS

Frederick C. Kerscher, Tallmadge, and John J. Nowacki, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 16, 1979, Ser. No. 57,781
Int. Cl.³ C08F *2/36*; B01J *8/08*
U.S. Cl. 422—131 **2 Claims**

1. In a substantially vertically disposed tubular gravity flow reaction apparatus for the continuous solid state polymerization of particulated low molecular weight polyester resin to high molecular weight polyester resin, said apparatus containing a continually downwardly flowing column of polymeriz-

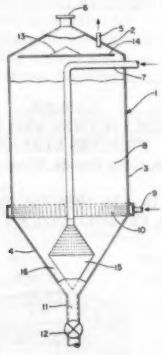
ing polyester resin maintained at an essentially constant level by the continuous addition of low molecular weight resin to the apparatus at a rate essentially equivalent to the rate of continuous withdrawal of high molecular weight resin from the apparatus, and wherein said apparatus comprises a casing consisting of

a. a top member having a gas outlet means and a low molecular weight resin inlet means to allow continuous addition of said resin to said apparatus;

b. an elongated tubular member comprising a continuous cylindrical sidewall of uniform circumference and having a first gas inlet means located in the upper portion of said tubular member extending perpendicularly from the cylindrical sidewall defining said tubular member to the longitudinal axis of the apparatus and then downwardly on said axis and through the column of polymerizing resin and ending in a terminus in the lower portion of said tubular wherein fixedly attached to said terminus of said first gas inlet means is a conical distribution means and a second gas inlet means attached to a peripheral gas distribution means located in lower portion of said tubular member; and

c. a conically shaped bottom member having a high molecular weight resin outlet means to allow for continuous withdrawal of the resin from said apparatus;

the improvement which comprises means for preventing or



minimizing back-mixing of particulate resin in said column of polymerizing resin and thereby maintaining said continually moving column of resin contained in said apparatus in a substantially uniform and plug flow condition from the upper portion of said apparatus to the lower portion thereof to prevent or minimize back-mixing of particulate resin in said column of polymerizing resin said means consisting of in combination

d. a resin distribution means located in said top member and fixedly mounted perpendicular to and centered on the longitudinal axis of said apparatus below said resin inlet means and above said first gas inlet means and the surface of said column of resin on support means located in and attached to the uppermost portion of said elongated tubular member to distribute the low molecular weight resin added through said inlet means evenly across the top of the column of resin in said apparatus; said resin distribution means comprising at least two angle iron shaped bars, said bars being spaced apart from one another and affixed to the support means such that the apexes of said bars are directed upwardly toward the resin inlet means, said bars further being positioned at a ninety degree angle to the horizontal portion of said first gas inlet means; and

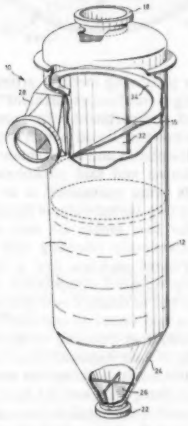
e. a flow regulating means located in the conical bottom member of said apparatus and above the high molecular weight resin outlet means therein, said regulating means comprising a singular baffle arrangement of two cones, an upper cone and a lower cone, said cones being fixedly attached to the terminus of the first gas inlet means through the apex of the upper cone and to each other at their bases, said upper cone having a series of spatially arranged perforations to allow gas entering through the first gas inlet means to pass through said cone and upwardly and countercurrently to the downwardly flow of the column of polymerizing resin and said lower cone having solid sides which form a uniform annular channel between the lower cone of said regulating means and the conical bottom member of the reaction apparatus wherein the distance between the sides of the lower cone of said flow regulating means and the conical bottom member of the reaction apparatus forming said uniform annular channel ranges from about one-fourth to one-sixth the diameter of the tubular member of said apparatus.

4,276,262

CHLORINE DIOXIDE GENERATOR

Gerald Cowley, Mississauga, Canada, assignor to ERCO Industries Limited, Islington, Canada

Division of Ser. No. 964,681, Nov. 29, 1978, Pat. No. 4,203,961.
This application Oct. 2, 1979, Ser. No. 81,269
Int. Cl.[3] **B01J** *8/00;* **B01D** *45/16;* **B01J** *19/02;* **C01B** *11/02*
U.S. Cl. 422—187 **12 Claims**



1. A chlorine dioxide generator comprising

a generally cylindrical body having upper and lower end closures, gaseous outlet means located in or adjacent to said upper end closure and slurry outlet means located in or adjacent to said lower end closure,

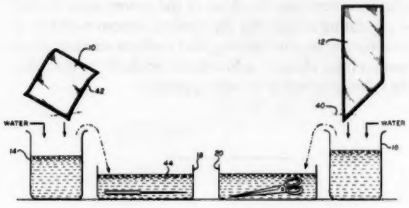
inlet means arranged tangentially to said cylindrical body terminating at its downstream end in communication with the interior of said body above the intended liquid level therein and below said gaseous outlet means for projection of reaction mixture into said body generally tangentially thereto, and

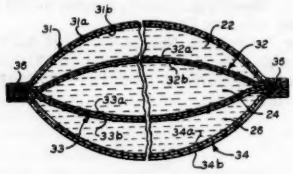
baffle means projecting substantially horizontally inwardly from the internal wall of said cylindrical body and extending in generally helical manner through 360° of turn from the upper extremity of the termination of said inlet means to the lower extremity thereof and arranged to be located above and follow substantially the flow path of said reaction mixture entering said generator.

4,276,263
STERILIZATION SYSTEM

Harold W. Andersen; Shirley R. Andersen, Both of Oyster Bay; Clifford Zaner, Holbrook, and Charles H. Harrison, Oyster Bay, all of N.Y., assignors to Anprosol Incorporated, Oyster Bay, N.Y.

Division of Ser. No. 924,018, Jul. 12, 1978, abandoned. This application Mar. 23, 1979, Ser. No. 23,493
Int. Cl.³ A61L *2/18*
U.S. Cl. 422—292 **9 Claims**





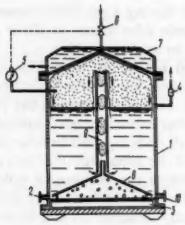
1. A system for sterilizing medical articles including metal articles comprising a multi-compartment package having a plurality of sealed compartments for separately storing the components of a sterilizing liquid which components comprise a hypochlorite, phosphates and a surfactant which is compatible with said chlorine and said phosphates, said separately stored components being maintained in an inactivated condition in their respective sealed compartment to prolong shelf-life until ready for use, means on said multi-compartment package for simultaneously releasing said components from said multi-compartment package, and a vessel for receiving said simultaneously released components and in which said components are mixed to thereby activate said sterilizing solution and provide in said vessel an activated sterilizing solution which is substantially non-irritating to tissue and which comprises 0.02 to 1% of said hypochlorite, 1.4 to 20% of said phosphates as di(alkali metal) phosphate and 0.08% to 21% as mono(alkali metal) phosphate, and 0.1 to 0.5% of said surfactant which is compatible with said chlorine and said phosphate, with the proviso that the lower limit of said di(alkali metal) phosphate is 4% when the amount of said hypochlorite is from 0.5 to 1%, said percentages being based on weight (in grams) per 100 ml. of solution, said articles to be sterilized being placed in said vessel to contact said sterilizing solution to thereby effect sterilization of said articles free of deleterious effects on said metal medical articles.

4,276,264
DEVICE FOR STERILIZING LIQUID MEDIA BY STEAM

Jury V. Redikultsev, mikroraion "G", dom 19, kv. 113; Alexandr N. Shkidchenko, mikroraion "G", dom 30, 51; Oleg P. Gorbunov, mikroraion "V", dom 28, kv. 18, and Leonid A. Litvinenko, mikroraion "AB", dom 8, kv. 74, all of Puschino Moskovskoi oblasti, U.S.S.R.

Filed Mar. 25, 1980, Ser. No. 133,842
Int. Cl.³ A61L *2/06*
U.S. Cl. 422—307 **1 Claim**

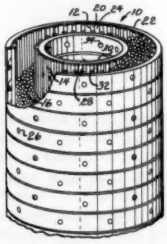
1. A device for sterilizing water-containing liquid media by steam comprising a sterilizing vessel; an inlet connection for said liquid media communicating with said sterilizing vessel; an outlet connection for said liquid media communicating with said sterilizing vessel; a heater disposed in the lower portion of said sterilizing vessel; a condenser arranged in the upper portion of said sterilizing vessel; a diffuser located in said vessel over said heater; and a gas-lift tube coaxially mounted within said sterilizing vessel and communicating with said diffuser on one end thereof.



4,276,265
SCREEN FOR COLLECTION AND DISTRIBUTION OF PROCESS STREAMS

George A. Gillespie, Coon Rapids, Minn., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 26, 1979, Ser. No. 107,490
Int. Cl.³ B01J *8/00, 8/12, 8/44*
U.S. Cl. 422—311 **8 Claims**



1. A multiple screen assembly for collecting and distributing a process flow stream uniformly comprising a plurality of spaced apart profiled wire members fixedly mounted relative to each other so as to define a plurality of slots through which the process stream can pass; a plurality of channel members positioned generally normal to said wire members, each of said channel members having a pair of integral leg portions welded to each of said wire members; apertures formed in said channel members, the outer edge of each leg portion of each of said channel members being positioned so close to the outer edge of a leg portion of the adjacent channel member that substantially all the process stream will flow through said apertures; the total open area of said apertures being less than the total open area of said plurality of slots to thereby induce a pressure drop in the process stream which will cause it to be distributed substantially uniformly through the slots which overlie the channel members on the downstream side of the process stream.

4,276,266
PROCESS FOR RECOVERING METAL ELEMENTS FROM CARBONACEOUS PRODUCTS

Didier Brun, Le Chesnay; Gerard Chrysostome, Fresnes; Alain Feugier, Orgeval, and Bernard Sale, Louveciennes, all of France, assignors to Institut Francais du Petrole and Societe Heurtey Effluthermn, both of Rueil-Malmaison, France

Filed Jul. 27, 1979, Ser. No. 61,549
Claims priority, application France, Jul. 27, 1978, 78 22544
Int. Cl.[3] C01G *1/00, 31/00, 53/00*
U.S. Cl. 423—1 **8 Claims**

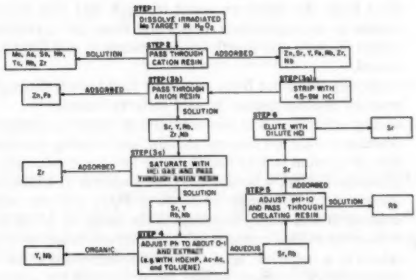
5. A process for recovering at least one metal element, other than alkali-metal, from alkali-metal-containing carbonaceous products, comprising oxidizing the carbonaceous products at a temperature of at least 800° C. in a fluidized bed of limestone sand comprising 25% to 75% by weight of calcium carbonate, and 75% to 25% by weight of silica, removing at least a fraction of the fluidized bed to extract therefrom said at least one metal element trapped by said limestone sand by a subsequent treatment of said fraction of the fluidized bed.

8. A process according to claim 5, wherein the step of extracting said at least one metal element comprises washing with water said withdrawn fraction of the fluidized bed.

4,276,267
HOT CELL PURIFICATION OF STRONTIUM-82, 85 AND OTHER ISOTOPES FROM PROTON IRRADIATED MOLYBDENUM

Glenn E. Bentley, and John W. Barnes, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 17, 1979, Ser. No. 86,021
Int. Cl.[3] C01F *1/00;* **C01G** *1/00;* **B01D** *11/04, 15/04*
U.S. Cl. 423—2 **11 Claims**



1. A process for producing and purifying strontium-82, said process comprising:

a. dissolving in an H_2O_2 solution a molybdenum target which had been irradiated by energetic protons having energies greater than about 200 MeV, so as to form a first solution;

b. passing said first solution over a cation exchange resin, so as to form a first adsorbed fraction and a second solution;

c. forming chlorocomplexes of anions found in said first adsorbed fraction and removing said chlorocomplexes from solution by anion exchange, thus forming at least one second adsorbed fraction and a third solution;

d. adjusting the pH of said third solution so that it lies within the range from about 0 to about 1 and extracting said third solution with (1) at least one alkyl organophosphorus compound, (2) at least one second compound selected from the group consisting of 2,4-pentanedione and fluorinated derivatives thereof, and (3) at least one aromatic solvent, thus forming an aqueous fraction and an organic fraction;

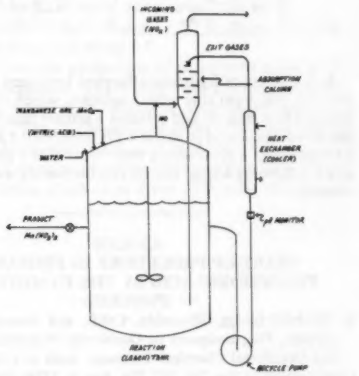
e. adjusting the pH of said aqueous fraction so that it is greater than 10 and then passing said aqueous fraction through a chelating resin, thus forming a third adsorbed fraction and a fourth solution; and

f. eluting said chelating resin with a first hydrochloric acid solution having a molarity within the range from about 0.5 to about 2.0 M, so as to form a fifth solution comprising strontium-82.

4,276,268
PROCESS FOR PREPARING MANGANESE NITRATE SOLUTION

Jay Y. Welsh, Catonsville, Md.; Alain Mullier, Tertre, and Pierre C. Picquet, Mons, both of Belgium, assignors to Chemetals Corporation, Baltimore, Md.

Filed Oct. 9, 1979, Ser. No. 82,581
Int. Cl.[3] C01G *45/08*
U.S. Cl. 423—49 **10 Claims**



1. A non-cyclic process of preparing manganese nitrate solution from a manganese ore containing manganese dioxide, comprising the steps of:

contacting a nitrogen dioxide containing gas with an aqueous medium and dissolving said nitrogen dioxide gas to form an aqueous nitrous acid-containing medium,

introducing said aqueous nitrous acid-containing medium and also introducing a manganese ore containing manganese dioxide into a closed reaction tank, and contacting said manganese ore with said aqueous nitrous acid-containing medium in said closed reaction tank,

leaching said manganese ore containing manganese dioxide with said aqueous nitrous acid-containing medium at a pH below about 4 and a temperature below about 80° C., to form a manganese nitrate solution,

adjusting a relative rate of addition of nitrogen dioxide containing gas and manganese ore containing manganese dioxide into said aqueous nitrous acid-containing medium to continuously control the concentration of nitrous acid and consequently to continuously decompose a controlled amount of nitrous acid to form nitric oxide, and

monitoring and maintaining the pH of said aqueous nitrous acid-containing medium by adjusting the relative rate of addition of nitrogen dioxide containing gas and manganese ore containing manganese dioxide to maintain a continuous, controlled decomposition of nitrous acid to form nitric oxide.

4,276,269

PROCESS OF HYDROMETALLURGICAL TREATMENT FOR ELIMINATING IMPURITIES FROM A SOLUTION CONTAINING DISSOLVED METALS

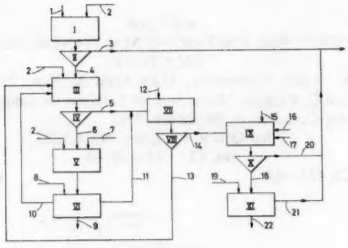
Serge R. de Lockerente, Alsemberg, and Jacques De Laever, Auderghem, both of Belgium, assignors to Hollux S.A., Belgium

Continuation-in-part of Ser. No. 903,612, May 8, 1978, abandoned. This application Oct. 24, 1979, Ser. No. 87,761

Claims priority, application Belgium, Apr. 28, 1978, 187262; Luxembourg, May 9, 1977, 77307

Int. Cl.³ C22B *19/26*

U.S. Cl. 423—101 **12 Claims**



1. A process of hydrometallurgical treatment for removing Fe^{+++} ions from zinc sulfate solution, which comprises adding, in a first step, to said solution a silicate capable of forming dissolved silicic acid in situ at a pH between 0.5 and 1.5 and, in a second step, a neutralizing base to provide a pH between 3.5 and 4.5, forming a solid silicate residue mainly made up of iron silicate.

4,276,270

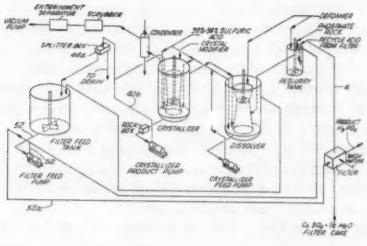
START-UP PROCEDURE IN PRODUCING PHOSPHORIC ACID BY THE HEMIHYDRATE PROCESS

F. Michael Gragg, Riverside, Calif., and James Self, White Springs, Fla., assignors to Occidental Research Corporation and Occidental Chemical Company, both of Irvine, Calif.

Continuation of Ser. No. 867,556, Jan. 6, 1978, abandoned. This application Oct. 5, 1979, Ser. No. 82,258

Int. Cl.³ C01B *25/22*; C01F *11/46*

U.S. Cl. 423—167 **10 Claims**



1. An improved startup process in a phosphoric acid production system comprising in combination a dissolver vessel for containing a first slurry comprising crystalline calcium sulfate hemihydrate, monocalcium phosphate and phosphoric acid, a crystallizer vessel for containing a second slurry comprising crystalline calcium sulfate hemihydrate, sulfuric acid and phosphoric acid, means in each of said vessels for maintaining a continuous circulation of the slurry therein, a first conduit means interconnecting said dissolver and crystallizer vessels for conducting said first slurry from said dissolver vessel to said crystallizer vessel, a second conduit means interconnecting said vessels for conducting said second slurry from said crystallizer vessel to said dissolver vessel, means for applying a vacuum to said crystallizer vessel to effect temperature control in said crystallizer vessel and means to form a vacuum seal between said dissolver and crystallizer vessels, means for introducing sulfuric acid to said crystallizer vessel, a reslurry vessel for slurrying phosphate rock and phosphoric acid, means for introducing phosphate rock and phosphoric acid to said reslurry vessel, a third conduit means interconnecting said reslurry vessel with said dissolver vessel, a filter feed vessel, and a fourth conduit means interconnecting said filter feed vessel with said crystallizer vessel, for conducting said second slurry to said filter feed vessel, and an agitator means in said filter feed vessel for maintaining the slurry therein in suspension, a fifth conduit means for conducting the slurry from said filter feed vessel to a separation means, for separating crystalline calcium sulfate hemihydrate from phosphoric acid of said last mentioned slurry, a sixth conduit means connecting said separation means with said reslurry vessel for conducting separated phosphoric acid to said reslurry vessel, and a seventh conduit means connecting said filter feed vessel and said reslurry vessel, said improved start-up process comprising the following steps:

a. substantially filling at least said dissolver and crystallizer vessels with phosphoric acid at a temperature in the range of 165°–215° F. and having a P_2O_5 analysis in the range of about 28 to 38%,

b. conducting a portion of said acid from said dissolver vessel through said first conduit means to said crystallizer vessel,

c. introducing phosphate rock and phosphoric acid to said reslurry vessel, feeding the resulting slurry through said third conduit means to said dissolver vessel and transferring a portion of the slurry from the dissolver vessel through said first conduit means to the crystallizer vessel,

d. as the volume of fluid in the vessels increases, cycling said fluid from the dissolver vessel through said first conduit means to the crystallizer vessel and from the crystallizer vessel through said fourth conduit means to said filter feed vessel,

e. recycling said fluid from said filter feed vessel, through a seventh conduit means, to said reslurry vessel,

f. adding sulfuric acid to said crystallizer vessel to produce a positive sulfate ion content therein, and causing precipitation of calcium sulfate hemihydrate and the production of phosphoric acid, whereby the phosphoric acid strength is increased to the range of 36–42% P_2O_5 and the solids content in said slurry becomes in the range of 25–35%,

g. while the sulfate content in the dissolver vessel is maintained at a, negative, level less than stoichiometric for the formation of calcium sulfate from the soluble calcium present in said dissolver, and

h. transporting said slurry from step (f) containing in the range of 25–35% solids through the filter feed vessel to said separation means,

i. separating the phosphoric acid from the calcium sulfate hemihydrate, and

j. recycling a portion of said separated phosphoric acid to said reslurry vessel.

4,276,271

PROCESS FOR THE REMOVAL OF HYDROGEN SULFIDE FROM GAS MIXTURES

William P. Manning; Stephen J. Rehm, and Jeffrey L. Schmuhl, all of Tulsa, Okla., assignors to Combustion Engineering, Inc., Windsor, Conn.

Continuation-in-part of Ser. No. 8,989, Feb. 5, 1979, abandoned. This application Dec. 3, 1979, Ser. No. 99,942

Int. Cl.³ B01D *53/34*

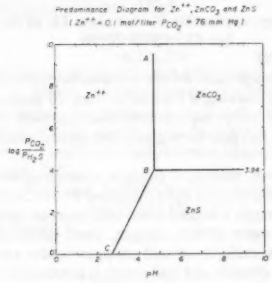
U.S. Cl. 423—226 **3 Claims**

1. A method for removing hydrogen sulfide from a gas mixture by the steps of,

forming an aqueous solution from a zinc salt,

adding an insoluble basic zinc compound in particulate form to the solution,

adding a soluble dispersant selected from the group including sodium, trisodium, and tetrapotassium polyphosphates; polyphosphonates; polysilicates; polyvinyl pyrolidones and co-polymers; polyacrylates and co-polymers; and co-polymers of maleic anhydride with styrene, vinyl alcohol, or butadiene, which will keep the particles of the



basic compound in suspension by reducing the surface tension of the solution and the degree of hydration of the particulate matter thereby obtaining stoichiometric usage of the basic compound,

and passing a mixture of gas and hydrogen sulfide through the solution for reaction of the hydrogen sulfide with the zinc salt to form zinc sulfide precipitate and free acid while the basic compound addition controls the pH and reforms the salt with the free acid.

4,276,272

CEMENT WASTE PRODUCT AS SCRUBBING MEDIUM FOR SULFUR OXIDES

Richard J. Schlager, Tracy, and James F. Murphy, Danville, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Mar. 17, 1980, Ser. No. 130,665

Int. Cl.[3] **B01J** *8/00;* **C01B** *17/00;* **C09K** *3/00*

U.S. Cl. 423—244 **6 Claims**

4. A process for removing sulfur oxides from industrial offgases which comprises scrubbing the offgases with a cement waste product which product is recovered as a byproduct from cement manufacturing plants and which is characterized by a particle size wherein a majority of the particles have a size below about 0.147 mm; the waste product being further characterized by being essentially anhydrous and containing rehydratable calcium compounds selected from the group of calcium oxide, calcium silicate, calcium aluminate, calcium sulfite, calcium sulfate and mixtures thereof; the cement waste product being preconditioned for scrubbing prior to its use as a scrubbing medium for sulfur oxides by intimately admixing the essentially anhydrous cement waste product with sufficient liquid water to at least rehydrate essentially all of the rehydratable components of the waste product, drying the preconditioned waste product at a temperature below at which any of the rehydrated components would be reconverted to the anhydrous form and utilizing the preconditioned and dried cement waste product as a scrubbing medium for the removal of sulfur oxides from industrial offgases.

4,276,273

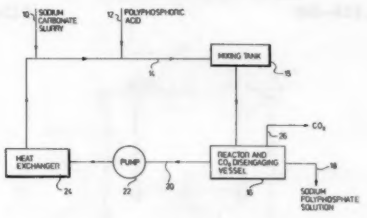
PRODUCTION OF SODIUM POLYPHOSPHATES

James D. McGilvery, Etobicoke, Canada, assignor to ERCO Industries Limited, Islington, Canada

Filed Aug. 11, 1980, Ser. No. 176,657

Int. Cl.[3] **C01B** *25/40*

U.S. Cl. 423—305 **16 Claims**



1. An aqueous solution of sodium polyphosphates which is stable to separation of a solid phase sodium polyphosphate and characterized by:

(a) a P_2O_5 content of about 32 to about 37% w/w,

(b) a mole ratio of Na:P of about 1.2:1 to about 1.5:1, and

(c) a pH of about 5 to about 6.5.

7. A process for the production of an aqueous solution of a sodium polyphosphate, which comprises reacting polyphosphoric acid and sodium carbonate in such proportions as to provide an Na:P ratio in the range of about 1.2:1 to about 1.5:1, such reaction being effected at a pH of about 5 to about 6.5 in the presence of water in quantities such as to provide a product solution containing about 32 to about 37% w/w of P_2O_5.

4,276,274

PROCESS FOR THE PRODUCTION OF FINELY DIVIDED OXIDES OF METALS OR SILICON

Emil Heckel, Kalmthout, Belgium, assignor to Degussa AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 26, 1976, Ser. No. 708,776

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1975, 2533925

Int. Cl.[3] **C01B** *33/18;* **C01G** *23/06;* **C01F** *7/02*

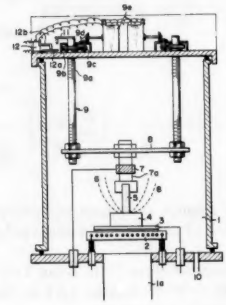
U.S. Cl. 423—336 **5 Claims**

1. In an improved process for the production of a finely divided oxide of Ti, Al, Si or mixtures thereof by the hydrolytic conversion of a corresponding volatile chloride of Ti, Al, Si or mixtures thereof in a flame; wherein said volatile chloride or said mixture of volatile chlorides in admixture with a combustible hydrogen-containing gas and air or oxygen are fed to a flame emitting from a burner into a reaction chamber to thereby form an oxide aerosol in waste gases from said burner; cooling said oxide and said waste gases; and separating said oxide from said waste gases; wherein the improvement comprises maintaining said waste gases substantially free of chlorine by reducing chlorine that forms during said conversion in said flame with hydrogen by single or multiple introduction of said hydrogen into the waste gas which is at a temperature of about 500° C. to 700° C. and while cooling said waste gas below the temperature at which hydrogen and oxygen react in said waste gas.

4,276,275
PROCESS FOR PREPARING ULTRAFINE CARBIDE POWDER

Yoshinori Ando, 1-17-1 Yamatedori, Showa-Ku, Nagoga-Shi, Aichi-ken, Japan; Sakae Inoue, and Kiyotaka Takahashi, both of Kasugai, Japan, assignors to Yoshinori Ando, Japan

Filed Nov. 14, 1979, Ser. No. 94,000
Claims priority, application Japan, May 23, 1979, 54-63521
Int. Cl.[3] C01B *31/36, 31/30*
U.S. Cl. 423—345 6 Claims



1. A process for preparing ultrafine carbide powder, which comprises the steps of passing electric current to a carbon member held in contact with a metal selected from the group consisting of silicon and titanium in a vacuum vessel into which an insert gas at a desired pressure is introduced, and collecting powder of a carbide of said metal that fumes into said inert gas as a result of a high-te:nperature reaction between said metal and carbon member in contact therewith.

4,276,276
PROCESS FOR NITRITE PRODUCTION

James P. Van Hook, Basking Ridge; Clair E. Hildebrand, Whippany, and Chong H. Chan, Princeton Junction, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 50,725, Jun. 21, 1979, abandoned. This application Mar. 28, 1980, Ser. No. 135,025
Int. Cl.[3] C01B *21/20*
U.S. Cl. 423—385 6 Claims

1. In a process for producing nitrite of the type characterized by

passing a feed gas comprising nitric oxide, nitrogen dioxide, and oxygen through an oxidizer in which aqueous nitric acid is recirculated to produce an oxidized gas and

passing said oxidized gas into an aqueous absorbtion solution containing a basically reacting compound of the formula MX, wherein M is selected from the group consisting of ammonium and the alkali metals and X is selected from the group consisting of carbonate, bicarbonate, hydroxide and mixtures thereof to produce a nitrite and unabsorbed exit gas; the improvement which comprises

monitoring the mole ratio of nitric oxide to nitrogen dioxide in the unabsorbed exit gas and

maintaining the nitric oxide:nitrogen dioxide mole ratio at about 0.8 to 1.2 in the unabsorbed exit gas by increasing nitric oxide oxidation when the ratio approaches 1.2 and decreasing nitric oxide oxidation when the ratio approaches 0.8.

4,276,277
MANUFACTURE OF CONCENTRATED NITRIC ACID

Gerard Aguinet, Meudon; Andre Le Bras, St-Andre-Les-Lilles; Jean Manoury, Ville D'Avray, and Edouard Martin, St-Cloud, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Continuation of Ser. No. 823,694, Aug. 11, 1977, abandoned, which is a continuation of Ser. No. 389,866, Aug. 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 152,103, Jun. 11, 1971, abandoned. This application Feb. 5, 1979, Ser. No. 9,293
Claims priority, application France, Jun. 12, 1970, 70.21795
Int. Cl.[3] C01B *21/40*
U.S. Cl. 423—393 2 Claims

1. A continuous process for the manufacture of very concentrated nitric acid having a titer of at least 70 percent from a gaseous mixture under superatmospheric pressure containing nitrogen oxides, oxygen, inert gases, and steam, which consists essentially of:

(1) continuously passing a gaseous mixture under superatmospheric pressure of between about 5 to 6 absolute atmospheres through a cooled area, said gaseous mixture containing nitrogen oxides, oxygen, inert gases and steam, whereby the majority of said nitrogen oxides are oxidized to nitrogen dioxide and said steam is condensed to a weak nitric acid solution;

(2) continuously dissolving said oxidized nitrogen oxides in the very concentrated nitric acid solution under a superatmospheric pressure between about 5 to 6 absolute atmospheres and at a temperature below 0° C.;

(3) continuously mixing said very concentrated nitric acid solution containing dissolved oxidized nitrogen oxides, said weak nitric acid solution and air containing nitrogen oxides under superatmospheric pressure between about 5 to 6 absolute atmospheres and for a time and temperature sufficient to substantially effect the reaction

$$2NO_2 \text{ (or } N_2O_4) + \tfrac{1}{2}O_2 + H_2O \rightarrow 2\ HNO_3;$$

(4) continuously removing very concentrated nitric acid having a titer of at least 70 percent and containing some dissolved unconverted oxidized nitrogen oxides therein and an air stream containing nitrogen oxides and some nitric acid vapor from said mixing step;

(5) continuously treating said very concentrated nitric acid having a titer of at least 70 percent and containing some dissolved unconverted oxidized nitrogen oxides therein with air under superatmospheric pressure between about 5 to 6 absolute atmospheres whereby said dissolved oxidized nitrogen oxides are removed into said air;

(6) continuously passing said air containing oxidized nitrogen oxides to said mixing step 3;

(7) continuously passing said air stream containing nitrogen oxides and some nitric acid vapor from step 3 to said step 1; and

(8) continuously recovering very concentrated nitric acid having a titer of at least 70 percent and recycling a portion thereof to said step 2.

4,276,278
SPIN SIZE AND THERMOSETTING AID FOR PITCH FIBERS

John B. Barr, Strongsville, and Nicholas F. White, III, North Olmsted, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Jan. 29, 1979, Ser. No. 7,322
Int. Cl.[3] D01F *9/12*
U.S. Cl. 423—447.4 9 Claims

1. In a process for producing carbon fibers comprising extruding a molten pitch into the form of continuous pitch filaments, combining the pitch filaments into a single multifilament bundle of pitch fibers, thermally stabilizing the pitch fibers by heating the fibers in the present of an oxidizing gas and then carbonizing the stabilized pitch fibers at elevated temperatures, the improvement whereby substantially all of

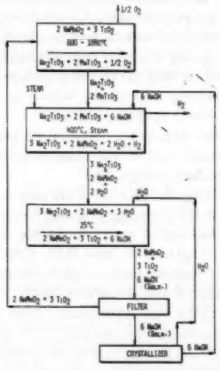
the pitch fibers in the multifilament bundle are uniformly coated with a mixture containing graphite or carbon black particles and an oxidizing agent, the graphite or carbon black particles serving to separate the pitch fibers in the bundle and thereby to improve penatration of the oxidizing gas said improvement comprising applying to the pitch fibers in the multifilament bundle prior to thermal stabilization an aqueous finishing composition comprising a dispersion of finely-divided graphite or carbon black particles in water in which is dissolved a water-soluble surfactant which is also capable of functioning as an oxidizing agent.

4,276,279

THERMOCHEMICAL GENERATION OF HYDROGEN AND OXYGEN FROM WATER

Paul R. Robinson, Knoxville, and Carlos E. Bamberger, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 8, 1980, Ser. No. 119,738
Int. Cl.[3] C01B *1/02*
U.S. Cl. 423—648 R **2 Claims**



1. A method for producing hydrogen comprising reacting manganese (II) titanate with sodium hydroxide, in the presence of steam, to yield sodium titanate, sodium manganate (III), water and hydrogen.

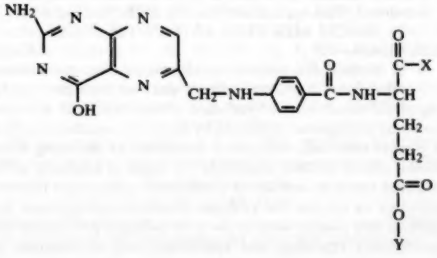
4,276,280

RADIOLABELED DERIVATIVES OF FOLIC ACID

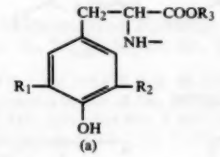
Anandrao S. Akerkar, Pomona, N.Y., and Herman Rutner, Hackensack, N.J., assignors to Becton, Dickinson and Company, Paramus, N.J.

Filed Sep. 29, 1976, Ser. No. 727,408
Int. Cl.[3] A61K *43/00*; C07D *475/04*; G01T *1/16*
U.S. Cl. 424—1 **32 Claims**

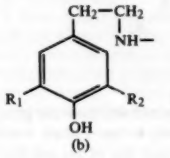
1. A compound having the following structural formula:



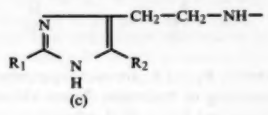
wherein Y is selected from the group consisting of —H, lower alkyl, or a cation selected from the group consisting of alkali metals, alkaline earth metals, and ammonium; X is selected from the group consisting of radicals having the following structural formula:



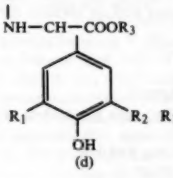
(a)



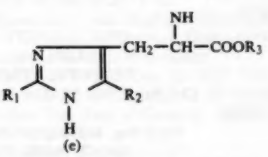
(b)



(c)



(d)



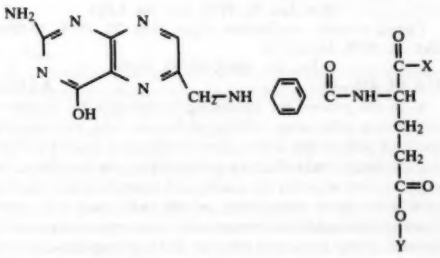
(e)

wherein R_1 and R_2 are each separately selected from the group consisting of hydrogen, fluoro, chloro, bromo-, nitro, lower alkoxy, lower alkyl and radioactive isotopes of iodine, wherein at least one of R_1 and R_2 is a radioactive isotope of iodine, and R_3 is selected from the group consisting of hydrogen, lower alkyl, an alkali metal and an alkaline earth metal.

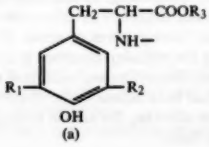
17. In the radioassay of folates, the improvement comprising:

employing a compound as defined in claim **1** as the tracer.

22. A compound having the following structural formula:



wherein y is selected from the group consisting of —H, lower alkyl, or a cation selected from the group consisting of alkali metals, alkaline earth metals and ammonium; X is selected from the group consisting of radicals having the following structural formula:



(a)

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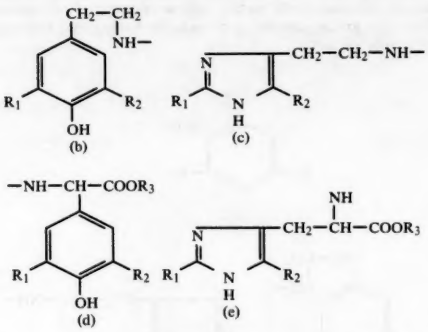


wherein R_1 and R_2 are each separately selected from the group consisting of hydrogen, fluoro, chloro, bromo-, nitro, lower alkoxy and lower alkyl, wherein at least one of R_1 and R_2 is hydrogen, and R_3 is selected from the group consisting of hydrogen, lower alkyl, an alkali metal and an alkaline earth metal.

4,276,281

BURN TREATMENT

George F. Crikelair, 2500 SE 21st St., Fort Lauderdale, Fla. 33316

Filed Sep. 4, 1980, Ser. No. 183,979

Int. Cl.[3] A61K *37/48*

U.S. Cl. 424—84 **2 Claims**

1. A method of treating burned mammalian tissue which comprises contacting the burned tissue with elastase in a concentration effective to substantially digest the burn eschar.

4,276,282

INTERFERON AND PREPARATIONS CONTAINING INTERFERON

Kaname Sugimoto, and Shokichi Yuen, both of Okayama, Japan, assignors to Ken Hayashibara, Okayama and Shin Ashida, Hyogo, both of, Japan

Filed Jan. 22, 1979, Ser. No. 5,585

Claims priority, application Japan, Jan. 22, 1978, 53-5368; Oct. 31, 1978, 53-134026

Int. Cl.[3] A61K *45/02, 39/00*

U.S. Cl. 424—85 **8 Claims**

1. In the process for producing human-specific interferon comprising cultivating established human cells, exposing the resultant cells to the action of an interferon inducer to induce the interferon, and collecting and purifying the interferon, the improvement whereby the quality and quantity of interferon is greatly increased, comprising, as said cultivating step, transplanting the established human cells into a non-human warm-blooded animal body, and wherein said exposing step is in vivo or in vitro.

2. In the process for producing human-specific interferon comprising cultivating established human cells, exposing the resultant cells to the action of an interferon inducer to induce the interferon, and collecting and purifying the interferon, the improvement whereby the quality and quantity of interferon is greatly increased, comprising, as said cultivating step, inoculating the established human cells onto a nutrient medium in a diffusion chamber having pores of about 10^{-7} to 10^{-5} m in diameter, placing the diffusion chamber in or on the body of a non-human warm-blooded animal such that the nutrient body fluids of the animal have access to the chamber, and multiplying the cells while allowing the animal to supply the cells with its nutrient body fluid.

4,276,283

METHOD OF PREPARING AN INTRAVENOUSLY ADMINISTRABLE IMMUNE GLOBULIN PREPARATION CONTAINING ANTIBODIES AND PREPARATIONS PRODUCED ACCORDING TO THIS METHOD

Martha Eibl; Otto Schwarz, and Yendra Linnau, all of Vienna, Austria, assignors to Immuno Aktiengesellschaft für chemisch-medizinische Produkte, Austria

Filed Sep. 10, 1979, Ser. No. 74,257

Claims priority, application Austria, Sep. 19, 1978, 6753/78

Int. Cl.[3] A61K *39/395, 39/00*

U.S. Cl. 424—85 **11 Claims**

1. A method of preparing an immune globulin preparation suitable for intravenous administration from an immune-globulin-containing fraction of blood plasma, which comprises

(a) purifying the immune-globulin-containing fraction, by treating it with an aqueous solution of a polyvalent salt selected from the group consisting of ammonium sulfate and an alkali phosphate, thereby obtaining a precipitate, which is separated from the aqueous solution and discarded and an immune-globulin-containing supernatant, and

(b) treating the supernatant from step (a) with an aqueous solution of a polyvalent salt selected from the group consisting of ammonium sulfate and an alkali phosphate, the salt solution having a higher concentration than the solution employed in step (a) thereby obtaining an immune-globulin-containing precipitate which is retained and a supernatent, which is discarded, and

(c) dissolving the precipitate containing immune globulin and the polyvalent salt in water and removing the polyvalent salt from the solution, and

(d) further purifying the solution from step (c) with polyethylene glycol in the presence of a saccharide selected from the group consisting of monosaccharide and disaccharide at an ionic strength of at least 0.15, thereby obtaining a supernatant containing immune globulin and a precipitate, which is separated and discarded, and

(e) further purifying the supernatant from step (d) by an additional treatment with polyethylene glycol, having a higher concentration than in step (d) thereby obtaining an immune-globulin-containing solution free from noxious impurities and a precipitate, which is separated and discarded, and

(f) treating the solution from step (e) with a water-soluble polymer selected from the group consisting of copolymers of ethylene oxide and polyoxypropylene (Pluronic), dextran, polyvinyl alcohol, polyvinyl pyrrolidone and polyethylene glycol, thereby obtaining an immune globulin precipitate, which can be formulated into a pharmaceutical preparation which can be administered intravenously.

4,276,284

PREVENTION OF COLLAGENASE INDUCED DISEASE BY TREATMENT WITH COLLAGENASE INHIBITORS

Stuart I. Brown, 85 East End Ave., New York, N.Y. 10028

Continuation of Ser. No. 166,278, Jul. 26, 1971, abandoned, which is a continuation-in-part of Ser. No. 821,505, May 2, 1969, abandoned. This application Dec. 10, 1975, Ser. No. 639,477

Int. Cl.[3] A61K *35/14, 37/00, 31/725, 31/195*

U.S. Cl. 424—101 **6 Claims**

1. A method for preventing ulceration of corneal tissues when said tissue is afflicted with an ulcerous condition consisting of Stevens-Johnson Syndrome wherein collagen is broken down by collagenase produced by incoming reparative cells at a greater rate than collagen is produced by incoming fibroblasts, which method comprises the steps of applying to the afflicted tissue an amount of a non-toxic collagenase inhibitor effective to reverse the collagen production/destructon balance of said disease state in favor of collagen production and periodically repeating said application step to maintain the

collagen production/destruction balance in favor of collagen production until said ulcerous condition is eliminated.

4,276,285

COMBINATIONS OF PENICILLANIC ACID 1,1-DIOXIDE WITH 7-(D-2-[4-ETHYLPIPERAZIN-2,3-DIONE-1-CARBOXAMIDO]-2-[4-HYDROXYPHENYL]ACETAMIDO)-3-([1-METHYL-5-TETRAZOLYL]THIOMETHYL)-3-DESACETOXYMETHYLCEPHALOSPORANIC ACID

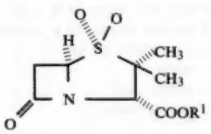
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 963,763, Nov. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 890,451, Mar. 29, 1978, abandoned, which is a continuation-in-part of Ser. No. 879,381, Feb. 21, 1978, abandoned, which is a continuation-in-part of Ser. No. 804,320, Jun. 7, 1977, abandoned. This application Mar. 5, 1979, Ser. No. 17,807 The portion of the term of this patent subsequent to Nov. 18, 1987, has been disclaimed.

Int. Cl.³ H61K *35/00*

U.S. Cl. 424—114 **9 Claims**

1. A method of treating a bacterial infection in a mammal subject which comprises administering to said subject (A) 7-(D-2-[4-ethylpiperazin-2,3-dione-1-carboxamido]-2-[4-hydroxyphenyl]acetamide)-3-([1-methyl-5-tetrazolyl]thiomethyl)-3-desacetoxymethylcephalosporanic acid or a pharmaceutically-acceptable salt thereof and (B) a compound of the formula



or a pharmaceutically-acceptable salt thereof, the weight ratio of (A) to (B) administered being in the range of from 1:6 to 6:1, the combined amounts of (A) and (B) administered constituting an antibacterially effective dosage and R_1 being selected from the group consisting of hydrogen, alkanoyloxymethyl having from 3 to 8 carbon atoms, 1-(alkanoyloxy)ethyl having from 4 to 9 carbon atoms, 1-methyl-1-(alkanoyloxy)ethyl having from 5 to 10 carbon atoms, alkoxycarbonyloxymethyl having from 3 to 6 carbon atoms, 1-(alkoxycarbonyloxy)ethyl having from 4 to 7 carbon atoms, 1-methyl-1-(alkoxycarbonyloxy)ethyl having from 5 to 8 carbon atoms, N-(alkoxycarbonyl)aminomethyl having from 3 to 9 carbon atoms, 1-(N[alkoxycarbonyl]aminoethyl having from 4 to 10 carbon atoms, 3-phthalidyl, 4-crotonolactonyl and gamma-butyrolactonyl-4-yl.

4,276,286

PROCESS FOR DECREASING AMMONIA CONCENTRATION IN DOMESTIC ANIMALS OR FOWLS

Eisuke Ishihara, Shizuoka; Hiroshi Yonehara, Tokyo; Katsuyuki Akasaki, Shimizu; Masao Minowa, and Katsumi Kobayashi, both of Shizuoka, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 32,253, Apr. 23, 1979, which is a continuation of Ser. No. 830,773, Sep. 6, 1977, abandoned, which is a continuation of Ser. No. 736,523, Oct. 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 681,198, Apr. 28, 1976, abandoned. This application Jan. 15, 1980, Ser. No. 112,218

Claims priority, application Japan, Oct. 28, 1975, 50/128910 The portion of the term of this patent subsequent to Jan. 6, 1988, has been disclaimed.

Int. Cl.³ A61K *35/00*

U.S. Cl. 424—117 **4 Claims**

1. A process for decreasing the ammonia concentration in the interior of the body of an animal or fowl and in the excrement of said animal or fowl which comprises administering an ammonia reducing effective amount of multhiomycin to said animal or fowl by giving to said animal or fowl a feed and/or drinking water containing multhiomycin.

4,276,287

PERIODONTAL POWDER

Alberto Cabardo, Jr., 709 Timberland Dr., Berrien Springs, Mich. 49103

Continuation of Ser. No. 681,618, Apr. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 256,388, May 24, 1972, abandoned. This application Nov. 7, 1977, Ser. No. 848,802

Int. Cl.³ A61K *33/06, 7/16, 33/00, 7/24*

U.S. Cl. 424—154 **16 Claims**

1. A method of periodontal therapy for bleeding and swollen gums and gingivitis comprising the step of applying a therapeutically effective amount topically to the gums of a mixture of evenly exsiccated potassium alum and sodium bicarbonate in a ratio, by weight, of approximately 2:1 of said potassium alum to said sodium bicarbonate.

4,276,288

DEHYDROOLIGOPEPTIDES, THEIR PRODUCTION AND THEIR MEDICINAL USE

Eugen Etschenberg; Wolfgang Opitz, and Siegfried Raddatz, all of Cologne, Fed. Rep. of Germany, assignors to Troponwerke GmbH & Co., KG, Cologne, Fed. Rep. of Germany

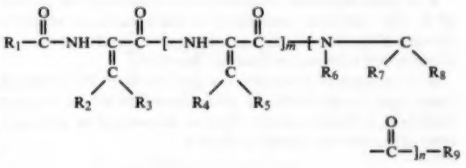
Continuation-in-part of Ser. No. 863,208, Dec. 22, 1977. This application Oct. 9, 1979, Ser. No. 82,451

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1976, 2659114; Oct. 11, 1977, 2745584

Int. Cl.³ A61K *37/00*; C07C *103/52*

U.S. Cl. 424—177 **21 Claims**

1. A dehydrooligopeptide of the following formula or its salts



in which

R_1 is straight-chain or branched C_1–C_6-alkyl which is unsubstituted or substituted by 1 to 3 halogenatoms or C_1–C_3-alkoxy; phenyl, styryl or thienyl

R_2 is hydrogen or C_1–C_4-alkyl

R_3 is phenyl, naphthyl, C_4–C_6-cycloalkyl, C_1–C_4-alkyl, an unsaturated heterocyclic radical which is unsubstituted or substituted by nitro

R_2 and R_3 together with the carbon atom to which they are attached represent cyclopentylidene, cyclohexylidene, cyclopentenylidene or cyclohexenylidene

R_4 is hydrogen, methyl or ethyl

R_5 is phenyl substituted by 1 to 3 halogen atoms or a heterocyclic group which is unsubstituted and contains 5 to 7 ring members and 1 to 2 nitrogen, oxygen or sulphur atoms

R_6 is hydrogen

R_7 is benzyl substituted by 1 or 2 halogen atoms or by hydroxyl or nitro; 2-methylmercaptoethyl or carboxymethyl;

R_8 is hydrogen

R_9 is hydroxyl or amino, C_1–C_{10}-alkylamino, C_1–C_5-alkoxy, C_1–C_{10}-alkylamino further substituted by 1 to 3 amino groups or by dialkylamino

and m and n are the same or different and each represents the

number 0 or the number 1, provided that m and n are not simultaneously the number 0; and provided that when R_1 is methyl, R_2 is hydrogen, R_3 is phenyl, m represents 0, R_6 is hydrogen, R_9 is hydroxyl, R_8 is hydrogen and n is 1, R_7 does not represent the 4-hydroxybenzyl radical.

4,276,289

ANTITUMOR GLYCOSIDES, THEIR PREPARATION AND USE

Giuseppe Cassinelli, Voghera; Daniela Ruggieri, Milan; Federico Arcamone, Nerviano, and Aurelio di Marco, Milan, all of Italy, assignors to Farmitalia Carlo Erba, S.p.A., Italy

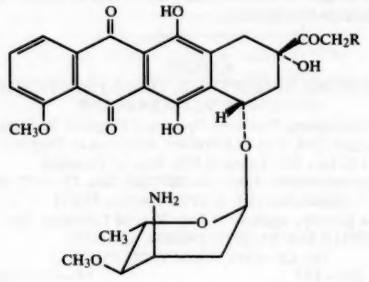
Filed Mar. 17, 1980, Ser. No. 131,035

Claims priority, application United Kingdom, Mar. 17, 1979, 9462/79

Int. Cl.[3] **A61K** *31/70;* **C07H** *15/24*

U.S. Cl. 424—180 **5 Claims**

1. An anthracycline glycoside of the formula I:



I

wherein R is hydrogen or hydroxyl and the hydrochlorides thereof.

4. A pharmaceutical composition for inhibiting the growth of P 388 leukemia comprising a therapeutically effective amount of an anthracycline glycoside as claimed in claim **1** in combination with an inert carrier therefor.

5. A method of inhibiting the growth of P 388 leukemia comprising intraperitoneally administering to a host afflicted therewith, a therapeutically effective amoung of an anthracycline glycoside as claimed in claim **1**.

4,276,290

PHOSPHONOUREIDE AND PHOSPHONOTHIOUREIDE ANTHELMINTICS

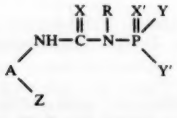
W. David Weir, Levittown, and Edward E. Kilbourn, Chalfont, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 842,645, Oct. 10, 1977, Pat. No. 4,183,921, which is a division of Ser. No. 625,988, Oct. 28, 1975, Pat. No. 4,076,809, which is a continuation-in-part of Ser. No. 354,629, Apr. 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 263,378, Jun. 5, 1972, abandoned. This application Sep. 6, 1979, Ser. No. 73,249

Int. Cl.[3] **A61K** *31/67, 31/665, 31/675*

U.S. Cl. 424—200 **6 Claims**

1. A compound of the formula (I):



(I)

wherein A is a divalent arylene group selected from phenylene, naphthalene, anthrylene or phenanthrylene or a divalent heterocyclic group selected from diazepinylene, pyridinylene, pyrimidylene, triethylene or furylene, substituted with

(a) vicinal alkylenedioxy of from 1 to 4 carbon atoms; or

(b) a group of the formula: $R^1(A')_a$ wherein R^1 is

(1) a substituted or unsubstituted 5 or 6 membered heterocyclic group, having as hetero atom, oxygen, sulfur or nitrogen, or any combination of these wherein the total number of hetero atoms does not exceed three; or

(2) an unsubstituted or substituted heterocyclic-alkyl group, wherein the heterocyclic group is as defined in (1) above and the alkyl group contains from 1 to 4 carbon atoms;

A′ is oxygen, sulfur, sulfinyl, sulfonyl or carbonyl; and a is an integer of 0 to 1;

R is

(a) hydrogen;
(b) (C_1–C_{10}) alkyl;
(c) (C_1–C_{10}) haloalkyl;
(d) (C_3–C_6) cycloalkyl;
(e) (C_2–C_{11}) alkoxyalkyl;
(f) (C_1–C_{10}) cyanoalkyl;
(g) (C_{13}–C_6) alkenyl;
(h) (C_3–C_6) haloalkenyl;
(i) (C_{13}–C_6) alkynyl;
(j) (C_{13}–C_6) haloalkynyl;
(k) benzyl; or
(l) phenyl;

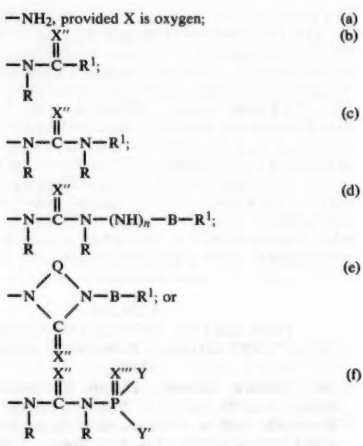
Y is R′, OR′, N(R′)$_2$ or SR′ and

Y′ is OR′, N(R′)$_2$ or SR′ wherein R′ is an aliphatic group of from 1 to 18 carbon atoms, or a substituted or unsubstituted (C_6–C_{10}) aromatic group;

X is oxygen or sulfur;

X′ is oxygen or sulfur; and

Z is a group of the formula:



(a)

(b)

(c)

(d)

(e)

(f)

wherein

R and R^1 are as defined above;

n is an integer of 0 to 1;

B is carbonyl, sulfinyl, or sulfonyl;

Q is alkylene of from 2 to 4 carbon atoms;

X″ is oxygen or sulfur, provided that when X″ is sulfur, X is oxygen; and

X‴ is oxygen or sulfur, and Y and Y′ are as above defined.

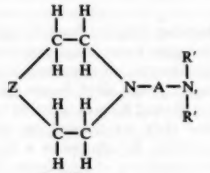
3. An anthelmintic composition for oral administration comprising an anthelmintically effective amount of the compound of claim **1** and a pharmaceutically acceptable carrier.

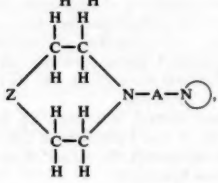
4,276,291
TERTIARY AMINO-SUBSTITUTED THIAZINES

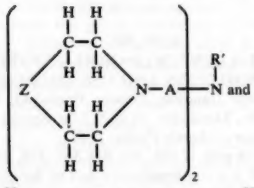
Fatrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

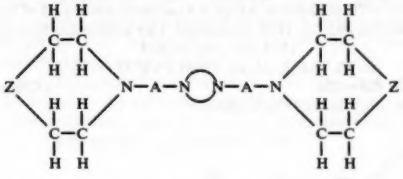
Division of Ser. No. 713,706, Aug. 12, 1976. This application Jun. 23, 1980, Ser. No. 161,984
Int. Cl.³ A01N *43/84, 43/86, 43/88*
U.S. Cl. 424—246 **10 Claims**

1. A method of inhibiting microbiological growth which comprises treating a system with a microbiocidally effective amount of a tertiary amino-substituted thiazine having the formula selected from the group consisting of


(1)


(2)


(3)


(4)

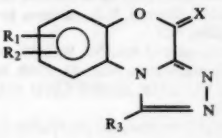
where Z is SO or SO_2, A is alkylene having 2 to 10 carbon atoms, R′ is alkyl or hydroxyalkyl, N◯ represents a cyclic amine group and N◯N represents a cyclic diamine group.

4,276,292
TRIAZOLOBENZOXAZIN-4-ONES

Vasil St. Georgiev, New Rochelle; Bernard Loev, Scarsdale; Robert Mack, Valley Stream, and John Musser, Hawthorne, all of N.Y., assignors to USV Pharmaceutical Corporation, Tuckahoe, N.Y.

Filed May 12, 1980, Ser. No. 149,080
Int. Cl.³ A61K *31/535;* **C07D** *498/04*
U.S. Cl. 424—248.4 **11 Claims**

1. An anti-allergic compound of the formula:



wherein,

X is S or O;

each of R_1 and R_2 is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, aralkyl, sulfonamido, halogen, alkoxy, alkenyloxy, alkynyloxy, cyano, hydroxy, acyloxy, nitro, amino, alkylamino, alkanoylamino, carbalkoxyamino, methanesulfonyl, carboxy, carbalkoxy or trihalomethyl, or taken together, methylenedioxy;

R_3 is hydrogen, hydroxy, alkyl, alkenyl, alkynyl, aryl, acyl, aralkyl, cycloalkyl, or carbalkoxy; and

acid addition salts thereof.

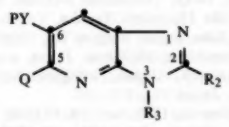
8. A therapeutic composition comprising a compound according to claim **1**.

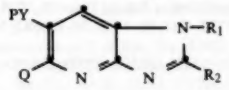
4,276,293
COMPOSITIONS AND THEIR PREPARATION

George Y. Lesher; Chester J. Opalka, Jr., both of Schodack, and Donald F. Page, East Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Mar. 28, 1980, Ser. No. 135,211
Int. Cl.³ C07D *471/04;* **A61K** *31/415*
U.S. Cl. 424—248.4 **10 Claims**

1. A 2-R_2-3-R_3-6-PY-5-Q-3H-imidazo[4,5-b]pyridine having formula I or 1-R_1-2-R_2-6-PY-5-Q-1H-imidazo[4,5-b]pyridine having formula IA


I


IA

where Q and R_2 are each hydrogen or lower-alkyl, R_1 and R_3 each are hydrogen, lower-alkyl, lower-hydroxyalkyl, 2,3-dihydroxypropyl, lower-alkoxyalkyl or Y-NB where Y is lower-alkylene having at least two carbon atoms between its connecting linkages and NB is di-(lower-alkyl)amino or 4-morpholinyl, and PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents, or pharmaceutically-acceptable acid-addition salt thereof.

10. The method for increasing cardiac contractility in a patient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form to such patient an effective amount of a cardiotonic 2-R_2-3-R_3-6-PY-5-Q-3H-imidazo[4,5-b]pyridine or 1-R_1-2-R_2-6-PY-5-Q-1H-imidazo[4,5-b]pyridine or pharmaceutically-acceptable acid-addition salt thereof, where Q and R_2 are each hydrogen or lower-alkyl, lower-hydroxyalkyl, 2,3-dihydroxypropyl, lower-alkoxyalkyl or Y-NB where Y is lower-alkylene having at least two carbon atoms between its connecting linkages and NB is di-(lower-alkyl)amino or 4-morpholinyl, and PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents.

4,276,294
BENZOFURYLPIPERAZINES

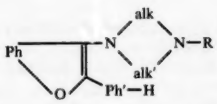
Robert M. Bowman, Summit, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 960,405, Nov. 30, 1978, abandoned. This application Mar. 31, 1980, Ser. No. 135,799

Int. Cl.[3] **A61K** *31/495;* **C07D** *405/04*

U.S. Cl. 424—250 **8 Claims**

1. A 1-(2-phenyl-3-benzofuryl)-piperazine compound of the formula



wherein each of Ph and Ph' is 1,2-phenylene, unsubstituted or substituted by up to 3 members selected from the group consisting of lower alkyl, hydroxy, lower alkoxy, benzyloxy, lower alkylenedioxy, lower alkylthio, halogeno, trifluoromethyl, nitro, amino, lower alkylamino and di-lower alkylamino; each of the radicals alk and alk' is lower alkylene separating both nitrogens by 2 or 3 carbon atoms and forming with them a 6 or 7 membered ring; and R is hydrogen, lower or higher alkyl or alkanoyl, lower alkoxycarbonyl, lower alkenyl, lower alkynyl or lower hydroxyalkyl, wherein the multiple bond or hydroxy group is separated from the nitrogen atom by at least 2 carbon atoms; lower alkylquaternaries or pharmaceutically acceptable acid addition salts thereof.

7. An anticonvulsant pharmaceutical composition comprising a spasmolytically effective amount of a compound claimed in claim **1**, together with a pharmaceutical excipient.

4,276,295
3-AROMATIC MOIETY SUBSTITUTED-4(3H)-QUINAZOLINONES, PROCESS FOR PRODUCTION THEREOF, AND USE THEREOF

Masayuki Ishikawa, 14-13, Akazutsumi 3-chome, Setagaya-ku, Tokyo, Japan (156); Hiromichi Tanaka, Yokohama, Japan; Yukuo Eguchi, Chiba, Japan; Shigeru Ito, Nagareyama, Japan; Yoshimi Takashima, Akishima, Japan, and Masahiko Kobayashi, Kokubunji, Japan, assignors to Masayuki Ishikawa, Tokyo, Japan

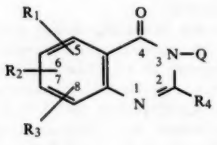
Filed Dec. 14, 1979, Ser. No. 103,841

Claims priority, application Japan, Dec. 19, 1978, 53-155764; Oct. 3, 1979, 54-126738; Oct. 18, 1979, 54-133582; Nov. 5, 1979, 54-141987

Int. Cl.[3] **A61K** *31/505;* **C07D** *239/90*

U.S. Cl. 424—251 **14 Claims**

14. A vasodilating, hypotensive and antiatherosclerotic pharmaceutical composition comprising a pharmaceutically effective amount of a compound selected from 3-aromatic moiety substituted-4-quinazolinones and their pharmaceutically acceptable acid addition salts and a pharmaceutically acceptable diluent or carrier, said quinazolinone compounds being of the formula



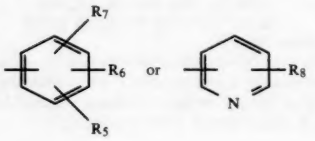
(I)

wherein

R_1 and R_3 represent lower alkyl and R_2 represents linear or branched lower alkoxycarbonyl in which R_1, R_2 and R_3 are located at the 5-, 6- and 7-positions or at the 6-, 7- and 8-positions in this order;

R_4 represents a member selected from the group consisting of hydrogen, linear or branched alkyl, monohalogenomethyl, trihalogenomethyl, acetoxymethyl and hydroxymethyl;

Q represents a group of the formula



in which

R_5 represents a member selected from the group consisting of hydrogen, halogen, lower alkyl and lower alkoxy, R_6 represents a member selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, trifluoromethyl and nitro, R_5 and R_6 may together represent methylenedioxy when they are located on adjacent carbon atoms on the nucleus, R_7 represents a member selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, trifluoromethyl, nitro, cyano, lower alkoxycarbonyl, hydroxymethyl, carboxymethyl, lower alkoxycarbonylmethyl, amino, di-lower alkylamino, and (di-lower alkylamino) lower alkyl, and R_8 represents hydrogen or lower alkyl; and

when R_4 represents methyl, and when R_1, R_2 and R_3 are located at the 6-, 7- and 8-positions in this order and R_4 represents hydroxymethyl, R_5, R_6 and R_7 do not simultaneously represent hydrogen.

4,276,296
SUBSTITUTED BENZOPYRANO[3,4-C]PYRIDINES, COMPOSITIONS AND USE THEREOF

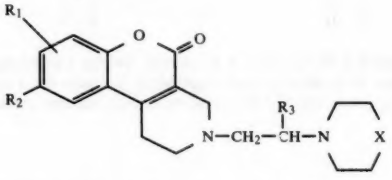
Richard E. Brown, Hanover; Chester Puchalski, Dover, and John Shavel, Jr., Mendham, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 916,397, Jun. 16, 1978, abandoned, which is a continuation-in-part of Ser. No. 743,839, Nov. 11, 1976, abandoned, which is a continuation-in-part of Ser. No. 548,298, Feb. 10, 1975, abandoned. This application Nov. 23, 1979, Ser. No. 97,014

Int. Cl.[3] **A61K** *31/44, 31/445;* **C07D** *491/052*

U.S. Cl. 424—256 **8 Claims**

1. A compound of the formula:



wherein R_1 and R_2 are lower alkoxy of 1–6 carbon atoms; R_3 is lower alkyl of 1–6 carbon atoms and X is CH_2 or a bond connecting the adjacent carbon atoms and the pharmaceutically acceptable acid addition salts thereof.

4,276,297
PYRIDYLAMINOTRIAZOLE THERAPEUTIC AGENTS

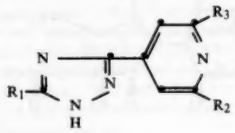
Christopher A. Lipinski, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jun. 18, 1979, Ser. No. 49,737

Int. Cl.[3] **A61K** *31/44;* **C07D** *401/04*

U.S. Cl. 424—263 **25 Claims**

1. A compound selected from the group consisting of 3-amino-5-(4-pyridyl)-1,2,4-triazole bases of the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein

R_1 is a member selected from the group consisting of amino, lower N-monoalkylamino and lower N,N-dialkylamino;

R_2 is a member selected from the group consisting of amino, N-monoalkylamino having from one to twelve carbon atoms, N,N-dialkylamino wherein at least one of said alkyl moieties is either methyl or ethyl and the other is alkyl having from one to twelve carbon atoms, N-monoallylamino, N-monomethallylamino, N-methyl-N-allylamino, N-ethyl-N-allylamino, N-mono(β-hydroxyethyl)amino, N-mono(γ-hydroxypropyl)amino, N-mono[β-(lower alkoxy)ethyl]amino, N-mono[γ-(lower alkoxy)propyl]amino, N-mono(2,2,2-trifluoroethyl)amino, N-monobenzylamino, N-methyl-N-benzylamino, N-ethyl-N-benzylamino, N-mono(β-phenylethyl)amino, N-mono(β-phenyl-β-hydroxyethyl)amino, and ring-substituted N-monobenzylamino, ring-substituted N-methyl-N-benzylamino, ring-substituted N-ethyl-N-benzylamino and ring-substituted N-mono(β-phenylethyl)amino with each ring having up to two substituents on the phenyl moiety wherein each of said ring-substituents is identically chosen from the group consisting of fluorine, chlorine, bromine, trifluoromethyl, lower alkyl, lower alkoxy, hydroxy, carbamoyl, sulfamoyl, lower alkylsulfonyl and methanesulfonamido, or is separately chosen from the group consisting of chlorine, methyl, methoxy, hydroxy and trifluoromethyl; and

R_3 is a member selected from the group consisting of hydrogen, lower alkyl, amino and lower-N-monoalkylamino.

24. A method for combatting peptic ulcers in the treatment of a subject afflicted with said condition, which comprises administering to said subject a anti-ulcer effective amount of a compound as claimed in claim **1**.

25. A pharmaceutical composition suitable for oral administration comprising a pharmaceutically acceptable carrier and a anti-ulcer effective amount of an anti-ulcer agent wherein said agent is a compound as claimed in claim **1**.

4,276,298

2-ARYL-1,2-BENZISOTHIAZOLINONE-1,1-DIOXIDES AND THEIR USE AS SELECTIVE PROTEASE INHIBITORS

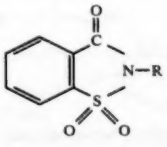
Howard Jones, Holmdel, N.J.; Robert L. Clark, Sequim, Wash., and Morris Zimmerman, Watchung, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 889,762, Mar. 24, 1978, abandoned. This application Sep. 6, 1979, Ser. No. 71,145

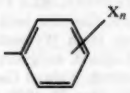
Int. Cl.[3] **C07D** *275/04*

U.S. Cl. 424—270 **10 Claims**

1. A compound of the formula:



wherein R is



[(a)]

where n is 1 or 2, except where X is fluoro, n may also be up to and including 5; and X is independently selected from (1) fluoro; (2) nitro, except that where X is only nitro, n must be 2 and X must be 2,4- or 3,5-dinitro; (3) trifluoromethyl; (4) cyano; (5) C_{1-3} alkoxycarbonyl; (6) C_{1-3} alkylcarbonyl (7) carboxyl; (8) carbamoyl; (9) C_{1-3} alkylacylamino; (10) C_{1-3} alkylsulfonyl; (11) N,N-di(C_{1-3} alkyl) sulfamyl; (12) trifluoromethoxy; (13) trifluoromethylthio; (14) trifluoromethylsulfonyl; and (15) trifluoromethylsulfinyl.

4,276,299

1-(3-BROMO-ISOXAZOL-5-YL)-2-TERT.BUTYLAMINOETHANOL

Davide Della Bella, and Dario Chiarino, both of Milan, Italy, assignors to Zambon S.p.A., Milan, Italy

Filed Dec. 18, 1979, Ser. No. 104,740

Claims priority, application Italy, Dec. 22, 1978, 31198 A/78

Int. Cl.[3] **A61K** *31/42;* **C07D** *261/06*

U.S. Cl. 424—272 **4 Claims**

1. A pharmaceutical composition for use as a bronchodilator comprising a therapeutically effective amount of a pharmaceutically acceptable salt of 1-(3-bromo-isoxazol-5-yl)-2-ter.-butylaminoethanol and a pharmaceutically acceptable carrier.

2. 1-(3-bromo-isoxazol-5-yl)-2-ter.butylaminoethanol.

4,276,300

AMINO-SUBSTITUTED-4,5,6,7-TETRAHYDRO-1H (OR 2H)-INDAZOLES

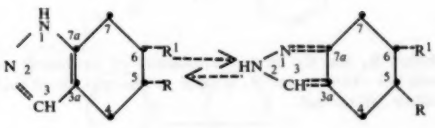
Nicholas J. Bach, and Edmund C. Kornfeld, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 5,064, Jan. 22, 1979, abandoned. This application Mar. 15, 1979, Ser. No. 20,559

Int. Cl.[3] **A61K** *31/41;* **C07D** *231/56*

U.S. Cl. 424—273 P **10 Claims**

1. A tautomer of the formulas



I II

wherein one of R and R^1 is H and the other is $N(R^2)_2$ wherein each R^2 is individually H, allyl, methyl, ethyl or n-propyl and pharmaceutically-acceptable acid addition salts thereof formed with non-toxic acid.

9. A method of inhibiting the secretion of prolactin in mammals which consists of administering to a mammal having a condition in which there is excess of prolactin being secreted and in need of treatment a dose of a compound according to claim **1** effective to reduce prolactin secretion.

4,276,301
IMIDAZOLE ALKYLTHIOUREA COMPOUNDS

Graham J. Durant; Charon R. Ganellin, both of Welwyn Garden City; Geoffrey R. Owen, High Wycombe, and Rodney C. Young, Bengeo, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

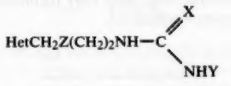
Division of Ser. No. 892,232, Mar. 31, 1978, Pat. No. 4,192,879, which is a division of Ser. No. 686,185, May 13, 1976, Pat. No. 4,098,898. This application Aug. 27, 1979, Ser. No. 70,184

Claims priority, application United Kingdom, May 21, 1975, 21817/75; Nov. 20, 1975, 47782/75

Int. Cl.[3] **C07D** *233/64, 233/68;* **A61K** *31/415*

U.S. Cl. 424—273 R **8 Claims**

1. A compound of the formula:



wherein X is sulphur; Y is amino, lower alkylamino, di(lower alkyl)amino, lower alkoxy, allyl, 2,2,2-trifluoroethyl, or $(CH_2)_nR$; Z is sulphur or methylene; Het is an imidazole ring which is attached at a ring carbon and which ring is optionally substituted by lower alkyl or halogen; n is an integer from 1 to 12; and R is hydroxy or lower alkoxy; or a pharmaceutically acceptable acid addition salt thereof.

8. A method of blocking histamine H_2-receptors which comprises administering to an animal in need thereof in an effective amount to block said receptors a compound of claim **1**.

4,276,302
MITICIDAL 2-(PHENOXY-ALPHA-ALKYL)-IMIDAZOLINES

Hans U. Brechbuhler, Basel; Günter Mattern, Liestal, and Walter Traber, Reinach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

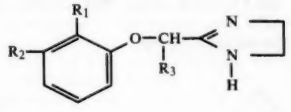
Filed Oct. 4, 1979, Ser. No. 81,964

Claims priority, application Switzerland, Oct. 9, 1978, 10469/78

Int. Cl.[3] **A01N** *43/50;* **C07D** *233/22*

U.S. Cl. 424—273 R **17 Claims**

10. A method of controlling plant damaging mites and mites which are parasites of animals, which comprises applying to the locus of said mites a miticidally effective amount of a compound of the formula



wherein R_1 and R_2, each independently of the other, are methyl or chlorine, and R_3 is ethyl or n-propyl, or an acid addition salt thereof.

4,276,303
MICROBICIDAL COMPOSITIONS

Walter Kunz, Oberwil; Wolfgang Eckhardt, Lörrach, and Adolf Hübele, Magden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

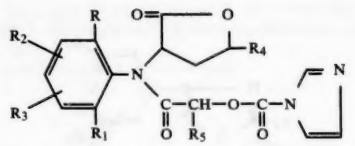
Division of Ser. No. 6,398, Jan. 25, 1979, Pat. No. 4,233,308. This application Aug. 1, 1980, Ser. No. 174,412

Claims priority, application Switzerland, Jan. 28, 1978, 931/78-7

Int. Cl.[3] **A01N** *43/50;* **C07D** *403/12*

U.S. Cl. 424—273 R **6 Claims**

1. A compound of the formula I



in which

R is C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen,

R_1 is hydrogen, C_1–C_3-alkyl, C_1–C_4-alkoxy or halogen,

R_2 is hydrogen, C_1–C_3-alkyl or halogen,

R_3 is hydrogen or methyl, with the total number of C atoms of the substituents R, R_1, R_2 and R_3 in the phenyl ring not exceeding 8,

R_4 and R_5 independently of one another are hydrogen or methyl.

5. A phytomicrobicidal composition which comprises as active ingredient an effective phytomicrobicidal amount of a compound of the formula I according to claim **1**, together with a suitable carrier therefor.

4,276,304
NOVEL BENZYLALCOHOL DERIVATIVE AND PROCESS FOR PREPARING THE SAME

Muneyoshi Ikezaki, Ageo; Katsuyuki Noguchi, Kitamoto; Hajime Iwai, Hasuda, and Masanori Inamasu, Misato, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

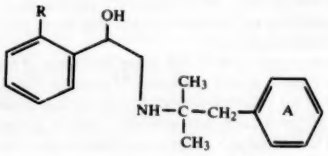
Filed Jan. 18, 1980, Ser. No. 113,218

Claims priority, application Japan, Jan. 31, 1979, 54-10562

Int. Cl.[3] **C07C** *91/34;* **A61K** *31/135*

U.S. Cl. 424—282 **36 Claims**

1. A benzylalcohol derivative of the formula:



(I)

wherein R is hydroxy, benzyloxy, alkoxy of one to 4 carbon atoms or halogen, and Ring A is monomethoxyphenyl, dimethoxyphenyl, trimethoxyphenyl or 3,4-methylenedioxyphenyl, or a pharmaceutically acceptable acid addition salt thereof.

4,276,305
CYCLOPROPANE CARBOXYLIC ACID ESTERS AND CYCLOPROPANE(THIO)-CARBOXYLIC ACID ESTERS

Milos Suchy, Pfaffhausen, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

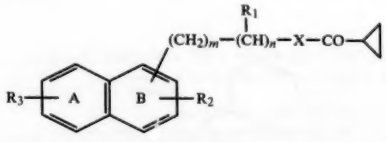
Filed Jan. 25, 1980, Ser. No. 115,313

Claims priority, application Switzerland, Feb. 9, 1979, 1290/79; May 18, 1979, 4674/79; Jan. 11, 1980, 214/80

Int. Cl.[3] **C07C** *153/09;* **A01N** *9/24;* **C07C** *69/74;* **A01N** *53/00*

U.S. Cl. 424—301 **9 Claims**

1. A compound of the formula

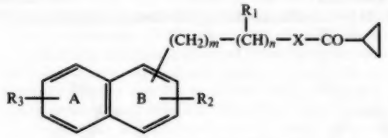


I

wherein R_1 is lower alkyl, halo-substituted lower alkyl, lower alkenyl, lower alknyl, cyano, phenyl, substituted phenyl wherein the substituents are selected from the group consisting

of halogen, methyl, ethyl, methoxy, ethoxy and nitro; R_2 is hydrogen, halogen, alkyl of from 1 to 3 carbons, alkoxy of from 1 to 3 carbons, alkenyloxy of 3 or 4 carbons, alkynyloxy of 3 or 4 carbon or nitro; R_3 is hydrogen, alkyl of from 1 to 3 carbons or alkoxy of from 1 to 3 carbons; X is sulphur; m is zero or an integer of from 1 to 3 and n is zero or 1; wherein one or both of rings A and B can be saturated and wherein m and n cannot simultaneously be zero.

6. A pesticidal composition which comprises inert carrier material and, as the active ingredient, an amount which is effective as a pesticide of at least one compound of the formula



I

wherein R_1 is lower alkyl, halo-substituted lower alkyl, lower alkenyl, lower alkynyl, cyano, phenyl, substituted phenyl wherein the substituents are selected from the group consisting of halogen, methyl, ethyl, methoxy, ethoxy and nitro; R_2 is hydrogen, halogen, alkyl of from 1 to 3 carbons, alkoxy of from 1 to 3 carbons, alkenyloxy of 3 or 4 carbons, alkynyloxy of 3 or 4 carbons or nitro; R_3 is hydrogen, alkyl of from 1 to 3 carbons or an alkoxy of from 1 to 3 carbons; X is sulphur; m is zero or an integer of from 1 to 3 and n is zero or 1; wherein one or both rings A and B can be saturated and wherein m and n cannot simultaneously be zero.

4,276,306

COMBATING ARTHROPODS WITH 3-PHENOXYBENZYL 2,2-DIMETHYL-3-VINYL-CYCLOPROPANE CARBOXYLATES

Rainer Fuchs, Wuppertal; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

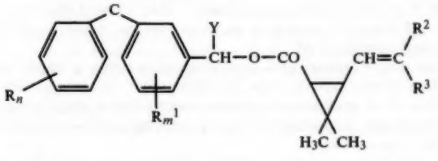
Filed Jun. 16, 1978, Ser. No. 916,163

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1977, 2730515

Int. Cl.[3] **A01N** *53/00*; **C07C** *69/75, 121/75*

U.S. Cl. 424—304 **9 Claims**

1. A 3-phenoxybenzyl 2,2-dimethyl-3-vinylcyclopropane carboxylate of the formula



in which

one of R and R^1 is fluorine and the other is hydrogen or fluorine,

R^2 is halogen,

R^3 is phenyl, or phenyl carrying at least one alkyl group or halogen atom,

Y is hydrogen or cyano,

n is 1, 2, 3, 4 or 5, and

m is 1, 2, 3 or 4.

7. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthopodicidally effective amount of a carboxylate according to claim 1.

4,276,307

N-PHENETHYLAMINOPROPIOPHENONES AS LIPOGENESIS INHIBITORS

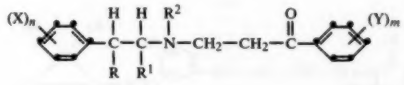
George R. Haynes, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 25, 1980, Ser. No. 115,467

Int. Cl.[3] **A61K** *31/275, 31/22, 31/165, 31/12*

U.S. Cl. 424—304 **1 Claim**

1. A method of inhibiting lipogenesis in a mammal, which comprises administering, to a mammal in need of said treatment, orally or parenterally a lipogenesis inhibiting amount of a compound of the formula:



wherein

R is hydrogen or hydroxyl;

R^1 is hydrogen or methyl;

R^2 is hydrogen or methyl;

n is zero, one or two;

X is hydroxyl, with the proviso that when n is one, the hydroxyl moiety is bonded to the carbon atom at the 4-position in the phenyl ring, and when n is two, the hydroxyl moieties are bonded to the carbon atoms in the 3- and 4-positions of the phenyl ring;

m is one;

Y is cyano

or their pharmacologically acceptable acid addition salts.

4,276,308

METHOD FOR CONTROLLING WOOD-DAMAGING INSECTS

Takaaki Ito, Kobe, and Tokio Watanabe, Hirakata, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

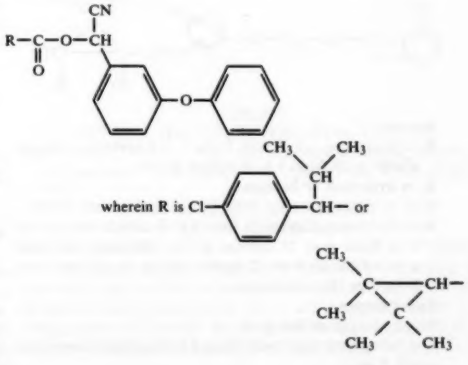
Filed Dec. 18, 1979, Ser. No. 104,995

Claims priority, application Japan, Dec. 25, 1978, 53-163615

Int. Cl.[3] **A01N** *37/34*

U.S. Cl. 424—304 **4 Claims**

1. A method for controlling insects harmful to wood including termites and powder-post beetles which comprises contacting the insects with a compound represented by the formula:

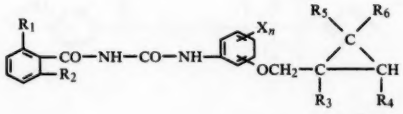


4,276,309
ACYLUREA INSECTICIDES

Heinrich Franke, and Hartmut Joppien, both of Berlin, Fed. Rep. of Germany, assignors to Schering AG, Berlin, Fed. Rep. of Germany

Filed Jul. 10, 1980, Ser. No. 167,317
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1979, 2928410
Int. Cl.³ C07C *127/22;* A01N *9/20*
U.S. Cl. 424—322 **52 Claims**

1. Acylureas of a composition having the general formula



wherein

R_1 is halogen, alkyl with from 1 to 6 carbon atoms, or alkoxy with from 1 to 6 carbon atoms;

R_2 is hydrogen or halogen;

R_3 is hydrogen or alkyl with from 1 to 6 carbon atoms;

R_4 is hydrogen, alkyl with from 1 to 6 carbon atoms, aryl with from 6 to 12 carbon atoms, halogen substituted aryl with from 6 to 12 carbon atoms, or alkaryl with from 7 to 12 carbon atoms;

R_5 is halogen;

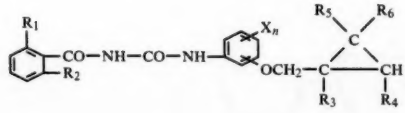
R_6 is hydrogen or halogen;

X is halogen or alkyl with from 1 to 6 carbon atoms; and

n is 0, 1 or 2.

51. A method for killing and/or eliminating insects comprising

placing in the possible pathway of the insects a composition having an effective insecticidal amount of the compound of the general formula



wherein

R_1 is hydrogen, alkyl with from 1 to 6 carbon atoms, or alkoxy with from 1 to 6 carbon atoms;

R_2 is hydrogen or halogen;

R_3 is hydrogen or alkyl with from 1 to 6 carbon atoms;

R_4 is hydrogen, alkyl with from 1 to 6 carbon atoms, aryl with from 6 to 12 carbon atoms, halogen substituted aryl with from 6 to 12 carbon atoms, or alkaryl with from 7 to 12 carbon atoms;

R_5 is halogen;

R_6 is hydrogen or halogen;

X is halogen or alkyl with from 1 to 6 carbon atoms; and

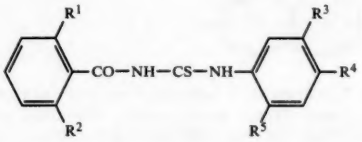
n is 0, 1 or 2.

4,276,310
COMBATING PESTS WITH N-(4-SUBSTITUTED-PHENYL)-N'-(2-SUBSTITUTED-BENZOYL)-THIOUREAS

Wilhelm Sirrenberg, Sprockhoevel; Erich Klauke, Odenthal; Ingeborg Hammann, Cologne; Ingomar Krehan, Cologne; Peter Kraus, Cologne, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 16, 1979, Ser. No. 67,246
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1978, 2837086
Int. Cl.³ C07C *157/12;* A01N *47/30*
U.S. Cl. 424—322 **11 Claims**

1. An N-(4-substituted-phenyl)-N'-(2-substituted-benzoyl)-thiourea of the formula



in which

R^1 represents halogen,

R^2 represents hydrogen or halogen,

R^3 represents hydrogen, halogen or halogenoalkyl,

R^4 represents halogen, halogenoalkyl, halogenoalkoxy, halogenoalkylthio or halogenoalkylsulphonyl, with the proviso that R^3 represents halogenoalkyl if R^4 represents halogen, and

R^5 represents hydrogen or halogen.

9. A method of combating arthropods or phytopathogenic fungi or bacteria, which comprises applying to the arthropods, fungi or bacteria, or a habitat thereof, an arthropodicidally, fungicidally or bactericidally effective amount of a compound according to claim **1**.

4,276,311
FOOD PRODUCT AND PROCESS

Ian E. Burrows, Gaddesby, and Peter A. Cheney, Leicester, both of England, assignors to Mars Limited, London, England

Continuation-in-part of Ser. No. 696,896, Jun. 17, 1976, abandoned. This application Jul. 24, 1979, Ser. No. 60,172
Int. Cl.³ A23B *4/12*
U.S. Cl. 426—56 **8 Claims**

1. A method of making a meat-in-jelly food product having a moisture content in the range of 65–95% and composed of pieces of edible proteinaceous tissue in a gelled aqueous phase, which product is microbiologically stable without the necessity of hermetic packaging and sterilization; which method consists essentially of

a. forming a mixture of said proteinaceous tissue, a source of fermentable carbohydrate, an antimycotic, an aqueous solution of an acid-sensitive, thermo-reversible or ionic gelling agent and an inoculum of acid-producing micro-organisms, by steps including:

i. dissolving said gelling agent to form said aqueous solution at elevated temperature, and

ii. admixing said inoculum of acid-producing micro-organisms at a temperature at which the viability of said micro-organisms is not impaired,

b. distributing said inoculum through said mixture prior to gelation of said gelling agent, and thereafter:

c. cooling said inoculated mixture to effect gelation of said gelling agent and

d. incubating the micro-organisms to produce acid sufficient to reduce the pH value of the gelled mixture to below 4.5, whereby the meat-in-jelly food product is microbiologically stabilized.

4,276,312
ENCAPSULATION OF MATERIALS

Carleton G. Merritt, R.D. #1, Slayton Rd., Cato, N.Y. 13033

Continuation of Ser. No. 909,390, May 25, 1978, abandoned, which is a continuation-in-part of Ser. No. 804,019, Jun. 6, 1977, abandoned, which is a continuation-in-part of Ser. No. 693,563, Jun. 7, 1976, abandoned. This application Jan. 18, 1980, Ser. No. 113,319

Int. Cl.[3] **A23L** *1/22, 1/226*

U.S. Cl. 426—96 **14 Claims**

1. Method for preparing encapsulated product comprising preparing a dispersion of encapsulating material, active material and water wherein weight of the encapsulating material to the total weight of the encapsulating material and water is at least about 55% and Brookfield viscosity of the dispersion containing the encapsulating material, the active material and water is at least about 300 cps measured at 70° C. wherein the encapsulating material is selected from the group consisting of modified starch, hydrolyzed gums, hydrolyzed gelatin and mixtures thereof and the active material is selected from the group consisting of essential oils, oleo resins, imitation flavors and fragrances and mixtures thereof; and spray drying said dispersion through a vortex creating device sufficiently small and an orifice sufficiently large to permit spray drying of said dispersion at a feed pressure of at least 1500 psi to produce a product having at least a substantial portion of its particles in elongated, non-spherical, rod-shaped form.

4,276,313
PROCESS FOR PREPARING MEAT PRODUCTS HAVING REDUCED SHRINKAGE

Peter W. Rose, R.R. 3 Covered Bridge Rd., S. Barrington, Ill. 60010

Continuation-in-part of Ser. No. 139,795, Apr. 14, 1980, which is a continuation-in-part of Ser. No. 129,727, Mar. 12, 1980. This application Jul. 7, 1980, Ser. No. 165,850

The portion of the term of this patent subsequent to Apr. 28, 1998, has been disclaimed.

Int. Cl.[3] **A23B** *4/02;* **A23L** *3/32*

U.S. Cl. 426—247 **48 Claims**

1. A process for preparing meat products with reduced shrinkage comprising the steps of:

providing meat;

providing an aqueous solution containing an edible chloride salt present at a concentration of at least about 0.2 molal;

passing a direct electric current through said aqueous solution to form an electrolyzed solution, said current passing through said solution at about 2 to about 20 amperes until at least about 25 coulombs have passed therethrough per liter of said solution;

combining said meat and said electrolyzed solution to contact said meat with said solution to form an admixture thereof within about 40 minutes after passage of said direct current through said electrolyzed solution has ceased;

maintaining said contact for a time period sufficient for the electrolyzed solution to penetrate said meat and enhance the moisture content thereof to form moisturized meat; and

recovering said moisturized meat.

15. A process for preparing ground meat comprising the steps of:

providing meat chunks;

providing an aqueous solution containing an edible chloride salt present at a concentration of at least about 0.2 molal;

passing a direct electric current of about 5 to about 15 amperes through said aqueous solution for a time sufficient to raise the pH value of the aqueous solution to at least about 8 while forming an electrolyzed solution;

combining said meat chunks and said electrolyzed solution to form an admixture while the pH value of said electrolyzed solution is at least about 8;

agitating said admixture until at least a portion of said electrolyzed solution is taken-up by said meat chunks to enhance the moisture content thereof and form moisturized meat chunks;

grinding said moisturized meat chunks to form a ground product; and

recovering said ground product.

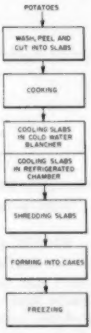
4,276,314
METHOD OF PREPARING HASH BROWN POTATO PRODUCT

Lowell J. Andersen, Grand Forks, N. Dak., assignor to International Co-op, Grand Forks, N. Dak.

Continuation of Ser. No. 845,806, Oct. 27, 1977, abandoned. This application Jul. 5, 1979, Ser. No. 55,066

Int. Cl.[3] **A23L** *1/216*

U.S. Cl. 426—272 **8 Claims**



1. A process for preparing a frozen hash brown potato product consisting essentially of the following method steps:

washing and peeling raw potatoes;

cooking said raw potatoes by exposure to hot water or steam;

cooling said potatoes to a temperature of about 50° to 55° Farenheit by exposing the potatoes to cold water and then further cooling said potatoes to a temperature of about 40° to 45° Farenheit by exposing the potatoes to a refrigerated chamber;

shredding the cooled potatoes at a temperature of about 40° to 45° Farenheit immediately after cooling to said temperature;

immediately forming the shredded potato material into cakes of a desired shape and size without the addition of binding agents; and

freezing the cakes.

4,276,315
METHOD FOR DECAFFEINATING COFFEE

Saul N. Katz, Monsey, N.Y., and Martin Gottesman, Paramus, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Feb. 12, 1979, Ser. No. 11,263

Int. Cl.[3] **A23F** *5/20*

U.S. Cl. 426—428 **7 Claims**

1. A process for decaffeinating moistened green coffee by extracting the coffee with liquid solvent selected from the group consisting of propane, butane and mixtures thereof at a temperature of from 30° to 95° C. and at a pressure which is below the critical pressure of the liquid solvent.

4,276,316
PROCESS FOR TREATING NUTS

Shri C. Sharma, Millington, N.J., assignor to CPC International Inc., Englewood Cliffs, N.J.

Continuation-in-part of Ser. No. 806,658, Jun. 15, 1977, abandoned. This application Mar. 29, 1978, Ser. No. 879,826
Int. Cl.[3] A23L *1/20, 1/36, 1/38*
U.S. Cl. 426—466 11 Claims

1. A method for treating raw edible nuts having intact skins comprising:

(a) contacting said nuts for from 30 to 180 seconds with heated gas having a temperature of between 125° and 175° C.,

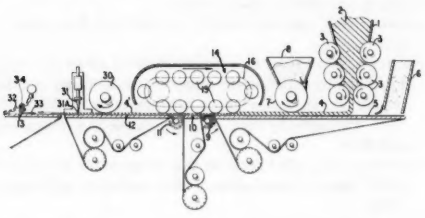
(b) immediately chilling said heated nuts to below 35° C. within 5 minutes; and

(c) blanching said chilled nuts to separate and remove their skins.

4,276,317
METHOD FOR PROCESSING BREAD DOUGH

Torahiko Hayashi, 3-4, Nozawa-machi, Utsunomiya-shi, Tochigi-ken, Japan

Continuation of Ser. No. 846,993, Oct. 31, 1977, abandoned, which is a division of Ser. No. 552,760, Feb. 25, 1975, Pat. No. 4,056,346. This application Apr. 16, 1979, Ser. No. 30,015
Claims priority, application Japan, Feb. 25, 1974, 49-22041
The portion of the term of this patent subsequent to Aug. 10, 1993, has been disclaimed.
Int. Cl.[3] A21D *6/00, 8/00*
U.S. Cl. 426—501 3 Claims



1. A method of producing bread dough comprising:

(a) forming the dough into a strip;

(b) placing said strip on a moving conveyor belt constituting the first in a series of conveyor belts;

(c) applying pulling forces to said strip by moving each of said belts in said series at a speed faster than the adjacent upstream conveyor belt while simultaneously applying repeated compressive forces to said strip and avoiding flattening of the dough by vertical downward pressure while said dough is being pulled by said series of conveyor belts to aid in reducing said strip to a thickness of from about 1 mm to about 4 mm without damaging the gluten tissue of the dough said compressive forces being applied by a plurality of rollers rotatably moving in an endless roller path extending over each of said conveyor belts so as to roll along said strip in the same direction of travel as said conveyor belts;

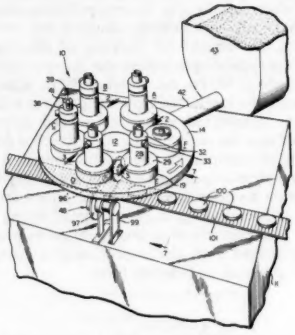
(d) subsequently cutting said strip into lengths; and

(e) forming layered masses of said dough from said lengths.

4,276,318
APPARATUS AND METHOD FOR MOLDING MEAT PATTIES

Gerald J. Orlowski, Scottsdale, Ariz.; Rodney D. Wicklund, Denver, Colo.; Richard D. Sandlas, Littleton, Colo., and Walter W. Weibler, Arvada, Colo., assignors to Armour and Company, Phoenix, Ariz.

Continuation of Ser. No. 959,384, Nov. 9, 1978, Pat. No. 4,193,167. This application Feb. 4, 1980, Ser. No. 118,212
Int. Cl.[3] B29C *1/00, 3/02, 3/04;* A22C *17/00*
U.S. Cl. 426—513 8 Claims



1. In the method of forming patties from a mass of agglomerable edible material such as meat wherein said edible material is fed upwardly under pressure from a feed means having a feed opening into each of a plurality of upwardly extending cavities which are moved successively into and out of communication with said feed opening, each cavity having a piston reciprocably mounted therein and each piston having a bottom surface cooperating with the cavity to define a patty-forming mold with a bottom opening, each piston being movable upwardly in its cavity for filling the mold with said edible material when the bottom opening of the mold is in communication with said feed opening and the piston thereafter being movable downwardly for discharging a formed patty from the cavity when the botton opening of the mold is out of communication with said feed opening;

the improvement which comprises the steps of restraining upward mold filling movement of each piston in its cavity until the bottom opening of the cavity is substantially completely aligned with and substantially fully exposed to said feed opening, and then freeing the piston for upward mold filling movement under the pressure of the edible material from the feed means.

4,276,319
PROCESS FOR THE PRODUCTION OF A GRANULATED PROTEIN GEL SUITABLE AS A MEAT EXTENDER

Thanh V. Nguyen, St. Louis, and Thomas J. Wagner, Hillsboro, both of Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Filed Jan. 17, 1979, Ser. No. 4,108
Int. Cl.[3] A23J *3/00*
U.S. Cl. 426—574 14 Claims

1. A process of forming dried granulated protein gel capable of rehydration with water under ambient conditions and in a rehydrated state being suitable as a meat extender comprising:

(a) hydrating a vegetable protein isolate having gel forming properties, with water to form a mixture having about 60–75% by weight of added water, and isolate having a protein content of at least about 90% by weight, said gel forming properties being defined as the ability of the isolate to form an aqueous protein gel upon heating of a slurry of the isolate having a viscosity at about 25° C. of

between about 0.9–1.1 × 10^6 cps, at about 100° C. for about 30 minutes, with the gel formed in this manner having sufficient strength to require at least about 50 g of force to penetrate the surface of the gel;

(b) extruding the hydrated isolate at a temperature of between about 75°–125° C. to form a protein gel, and

(c) granulating and drying said gel to achieve a shelf stable moisture content under non-puffing conditions.

4,276,320

COMPOSITIONS AND METHOD FOR PREPARING DESSERT GELS

Arthur L. Moirano, Mountainside, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Jan. 25, 1980, Ser. No. 115,582
Int. Cl.³ A23L *1/04*
U.S. Cl. 426—575 **11 Claims**

1. A composition, useful for the preparation of edible carrageenan water gels having controlled melting temperatures, consisting essentially of kappa carrageenan, a non-toxic sodium salt of a sequestering agent, and non-toxic potassium in an ionizable form, said sequestering agent and said potassium being present in said composition in amounts sufficient, respectively, to sequester substantially all of the polyvalent cations present when the composition is dissolved in an aqueous medium, and to provide the sol (such aqueous medium) with a potassium ion content of from about 200 to about 800 ppm.

4,276,321

METHOD OF PREPARING SHAPED RICE FOOD

Yoshio Nagatani, Tokyo, Japan, assignor to Nagatanien Honpo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 826,997, Aug. 23, 1977, abandoned. This application Nov. 22, 1978, Ser. No. 963,102
Claims priority, application Japan, Apr. 8, 1977, 52/40056
Int. Cl.³ A23L *1/00*
U.S. Cl. 426—618 **1 Claim**

1. A method of preparing a predetermined shaped rice food which shape is maintained when the shaped rice food is handled, said method comprising the following steps in the order named:

(a) treating a predetermined amount of boiled rice grains with a predetermined amount of at least one ingredient to form a food mixture wherein the boiled rice grains change from a normally mutual viscous condition to a second nonviscous condition such that the bonding strength among said boiled rice grains in said treated food mixture is weakened to prevent the formation of a predetermined rice food shape when compressed;

(b) disposing said treated food mixture in a container of predetermined shape;

(c) freezing said treated food mixture disposed in said container of predetermined shape;

(d) removing said frozen treated food mixture from said container of predetermined shape;

(e) wrapping said treated food mixture in a predetermined shape heat-shrinkable film; and

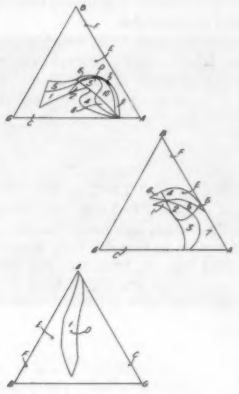
(f) heating said predetermined shape heat-shrinkable film wrapped frozen treated food mixture to soften and swell said boiled rice grains and shrink said predetermined shape heat-shrinkable film wrapped treated food mixture to compress said treated food mixture whereby said condition of said rice grains changes from said second nonviscous condition to said normally mutual viscous condition to form a predetermined shape heat-shrinkable film wrapped treated food mixture which maintains said predetermined shape when said film is removed and said shaped rice food is handled.

4,276,322

CHOCOLATE HAVING DEFINED HARD FAT

Frederick B. Padley, Welwyn Garden City, England; Cornelis N. Paulussen, Uitgeest; Cornelis Soeters, Rotterdam, both of Netherlands, and David Tresser, London, England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 711,048, Aug. 2, 1976, abandoned, which is a continuation of Ser. No. 344,792, Mar. 26, 1973, abandoned. This application May 11, 1977, Ser. No. 795,830
Int. Cl.³ A23D *5/00*; A23G *1/00*
U.S. Cl. 426—660 **1 Claim**



1. Chocolate in which the hard fat present has a 1,3-dipalmitoyl-2-oleoyl glycerol/1-palmitoyl-2-oleoyl-3-stearoyl glycerol/1,3-distearoyl-2-oleoyl glycerol (POP/POS/SOS)-composition within an area defined in FIG. **18**, **19** or **20** and consists of a hard fat or blend of hard fats consisting of at least 60% 1,3-dipalmitoyl-2-oleoyl-3-stearoyl glycerol (POP), 1-palmitoyl-2-oleoyl-3-stearoyl glyceride (POS) and 1,3-distearoyl-2-oleoyl glycerol (SOS) but with a 1,3-dipalmitoyl-2-oleoyl glycerol/1-palmitoyl-2-oleoyl-3-stearoyl glycerol/1,3-distearoyl-2-oleoyl glycerol (POP/POS/SOS)-composition outside the area and a 1,3-distearoyl-2-oleoyl glycerol/1-palmitoyl-2-oleoyl-3-stearoyl glycerol (SOS/POS)-fat consisting essentially of

(A) from 80% to 98% of 1,3-distearoyl-2-oleoyl glycerol (SOS) and 1-palmitoyl-2-oieoyl-3-stearoyl glycerol (POS),

(B) other oleoyl, palmitoyl and stearoyl (O,P and S) triglycerides consisting, by weight of the 1,3-distearoyl-2-oleoyl glycerol/1-palmitoyl-2-oleoyl-3-stearoyl glycerol (SOS/POS)-fat, of

(a) less than 5% of trisaturated glycerides (GGG),

(b) less than 5% of tripalmitoyl glycerol (PPP),

(c) less than 3% of eachh trisaturated glyceride (GGG) other than tripalmitoyl glycerol (PPP),

(d) less than 10% 1,2-disaturated-3-oleoyl glycerol (GGO) consisting, by weight of the 1,3-distearoylglycerol (SOS/POS)-fat, of

(1) less than 5% of each of 1-palmitoyl-2-stearoyl-3-oleoyl glycerol (PSO) and 1-stearoyl-2-palmitoyl-3-oleoyl glycerol (SPO),

(2) less than 3% 1,2-dipalmitoyl-3-oleoyl glycerol (PPO), and

(3) less than 8% 1,2-distearoyl-3-oleoyl glycerol (SSO),

(e) less than 10% 1,2-dioleoyl-3-saturated glycerol (OOG),

(f) 1,3-dipalmitoyl-3-oleoyl glycerol (POP), and

(C)

(a) less than 10% of each of 1,3-distearoyl-2-elaidoyl (and double bond isomers of elaidoyl) glycercol (SES) and 1,3-distearoyl-2-linoleoyl glycerol (SLnS),

(b) less than 5% of each of 1-palmitoyl-3-stearoyl-2-elaidoyl (and double bond isomers of elaidoyl) glycerol (PES),

1-palmitoyl-2-linoleoyl-3-stearoyl glycerol (PLnS), 1,3-dipalmitoyl-2-elaidoyl (and double bond isomers of elaidoyl) glycerol (PEP) and 1,3-dipalmitoyl-2-linoleoyl glycerol (PLnP), and

(D) partial oleoyl, palmitoyl and stearoyl (O, P and S), glycerides consisting, by weight of the 1,3-distearoyl-2-oleoyl glycerol/1-palmitoyl-2-oleoyl-3-stearoyl glycerol (SOS/POS)-fat, of

(a) less than 10% of each of total mono-glycerides, of total diglycerides, of glycerides containing at least one oleoyl group (O), and of unsaturated monoglycerides, and

(b) less than 6% of each of saturated mono-glycerides and of disaturated diglycerides,

in (B), (C) and (D) at most 15%, based on the total fatty acids residues in the 1,3-distearoyl-2-oleoyl glycerol/1-palmitoyl-2-oleoyl-3-stearoyl glycerol (SOS/POS)-fat, of palmitoyl and stearoyl (P and S) being randomly replaced by myristoyl and arachidonoyl (M and A).

4,276,323

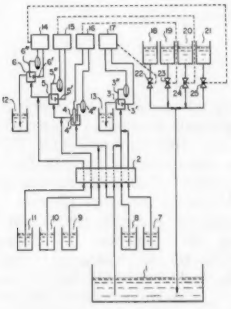
PROCESS FOR CONTROLLING OF CHEMICAL COPPER PLATING SOLUTION

Hitoshi Oka, Yokohama, and Kenji Nakamura, Fujisawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 21, 1979, Ser. No. 106,083

Int. Cl.³ C23C *3/02*

U.S. Cl. 427—8 **1 Claim**



1. A process for controlling a composition of a chemical copper plating solution, which comprises:

(a) continuously adding an acid solution to a definite volume of an alkaline chemical copper plating solution continuously sampled from a chemical plating tank, thereby making pH 4–9, measuring a potential of the resulting solution by a glass electrode-reference electrode, emitting a difference in potential as a signal, when the measured potential is lower than a set potential of a pH control unit, thereby supplying an alkali solution to the plating tank from an alkali supplementing solution tank, or when the measured potential is higher than the set potential, thereby discontinuing the supplying of the alkali solution thereto, and thereby keeping the pH of the plating solution in the plating tank continuously constant,

(b) continuously adding to the solution leaving the pH measurement a definite volume of metal ions capable of forming a complex compound with a complexing agent in a little excess of the amount of free complexing agent in the solution, measuring a potential of the resulting solution by an insoluble electrode and a reference electrode, supplying a copper ion supplementing solution to the plating tank when the measured potential is lower than a set potential of a copper ion control unit, or discontinuing the supplying of the copper ion supplementing solution thereto when the measured potential is higher than the set potential, and thereby keeping a concentration of copper ions in the plating solution in the plating tank continuously constant,

(c) continuously adding to the solution leaving the measurement of copper ion concentration a definite volume of metal ions capable of forming a complex compound with a complexing agent in a little excess of all the amount of complexing agent in the solution, measuring a potential of the solution by an insoluble electrode and a reference electrode, supplying a complexing agent supplementing solution to the plating tank when the measured potential is higher than a set potential of a complexing agent control unit, or discontinuing the supplying of the supplementing solution when the measured potential is lower than the set potential, and thereby keeping a concentrtion of the complexing agent in the plating tank continuously constant, and

(d) continuously adding a definite volume of sulfite ions and iodine to a definite volume of a chemical copper plating solution continuously sampled from the chemical plating tank, measuring a potential of the resulting solution by an insoluble electrode and a reference electrode, supplying a reducing agent supplementing solution to the plating tank when the measured potential is lower than a set potential of a reducing agent control unit, or discontinuing the supplying of the supplementing solution thereto, when the measured potential is higher than the set potential, and thereby keeping a concentration of reducing agent in the plating solution in the plating tank continuously constant.

4,276,324

METHOD FOR THE CONTACT-FREE CONTINUOUS MEASUREMENT AND MONITORING OF MAGNETIC TRACKS ON MOVING FILM STRIPS

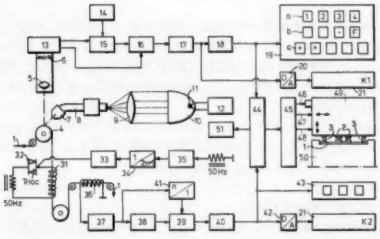
Friedmar Pöhler, Bergisch-Gladbach; Hans Falk, Leverkusen; Josef Müller, Marialinden; Hans J. Klein, Wuppertal, and Franz Hoffacker, Langenfeld, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Mar. 19, 1979, Ser. No. 21,964

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1978, 2812633

Int. Cl.³ G01B *7/04, 11/04*

U.S. Cl. 427—10 **9 Claims**



1. A method of substantially continuously measuring and monitoring the width, thickness and position of magnetic tracks on a moving film strip, which method is free of contact with the film strip and which is approximately independent of the speed of movement of the film strip, characterized in that the magnetic track width and magnetic track position are measured optically and the thickness of the magnetic track is measured electromagnetically, the method being further characterized in that the optical measurement is performed by illuminating the film strip and the magnetic tracks, projecting the illuminated magnetic tracks onto an electronic camera which generates a scanning electrical signal corresponding to the width and position of the illuminated magnetic tracks, generating a limit value signal predetermining minimum and maximum edge positions for the magnetic tracks, electrically

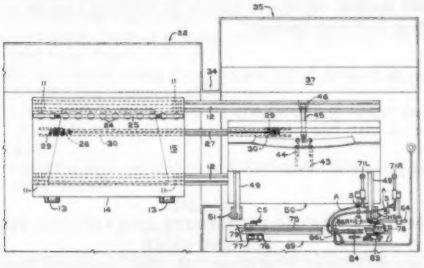
continuously comparing the scanning electrical signal with the limit value signals whereby the width and position of the magnetic tracks is determined, displaying the difference between the limit value signals and the scanning electrical signals to monitor whether the tracks are of the proper width and correctly positioned on the film strip, the electromagnetic measurement being further characterized by the steps of magnetizing a portion of the moving film strip to saturation by transmitting pulse of periodically changing polarity through it, measuring a signal generated in response to the pulses of the magnetic tracks on the film strip, and reading out the measured signals to determine whether they comply with a predetermined standard which corresponds to the thickness of the tracks.

4,276,325

METHOD FOR SUPPORTING FLEXIBLE SHEET WHILE APPLYING GRADED SHADE BAND THEREON

Dennis S. Postupack, Natrona Heights, and David A. Allerton, Glenshaw, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 21, 1978, Ser. No. 898,589
Int. Cl.³ B05D *1/04, 5/06*
U.S. Cl. 427—14.1 **14 Claims**



1. A method of handling a sheet of flexible interlayer material during the application of a shade band to an elongated area on one surface thereof by electrostatic spraying comprising

loading said flexible sheet with its opposite surface against an apertured vacuum platen in unwrinkled condition while said platen is supported in a substantially horizontal plane at a loading and unloading chamber,

applying vacuum to said apertuted vacuum platen sufficient to hold said flexible sheet in unwrinkled condition thereagainst but insufficient to cause said flexible sheet to distort in the vicinity of the apertures of said vacuum platen,

transferring said sheet to a coating chamber while supported in a substantially horizontal plane against said apertured vacuum platen by said vacuum,

tilting said flexible sheet and said vacuum platen to an oblique orientation in alignment with an obliquely supported platen mask in said coating chamber while continuing to support said flexible sheet against said vacuum platen by vacuum, and

electrostatically spraying a coating onto said elongated area of said flexible sheet through an opening in said platen mask while said flexible sheet is tilted and supported by vacuum against said vacuum platen and aligned with said platen mask in said coating chamber.

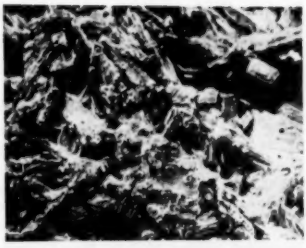
4,276,326

FREE FLOWING BUILDER BEADS AND DETERGENTS

David Joshi, Piscataway, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 661,471, Feb. 26, 1976, abandoned. This application Dec. 28, 1978, Ser. No. 973,962
Int. Cl.³ C11D *3/075, 3/08, 11/02, 17/06*
U.S. Cl. 427—220 **40 Claims**

1. A method for producing a free flowing base builder bead comprising hydrating a first quantity of anhydrous phosphate builder salt in the presence of an alkali metal silicate to form an aqueous slurry; adding a second quantity of anhydrous phosphate builder salt to said slurry to form a crutcher mix, said addition being made under conditions which maintain said second quantity of phosphate builder in an anhydrous state; spray drying said crutcher mix to form a particulate material, the weight ratio of said first quantity of builder salt to said alkali metal silicate being from about 1.5 to about 5 and the weight ratio of said first quantity of builder salt to said second quantity of builder salt being from about 0.3 to about 0.7.



8. A method of producing a free flowing particulate detergent containing from about 10 to about 40 percent by weight of a liquid or semi-solid nonionic detergent material comprising the steps of supplying base builder beads made in accordance with the process of claim **1** having a porous outer surface and a skeletal internal structure, applying said nonionic detergent onto said beads such that said nonionic detergent impregnates said beads.

4,276,327

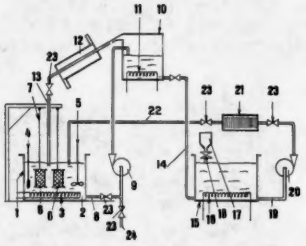
PROCESS FOR DEPOSITING ALUMINA ONTO A SUBSTRATE AND ALUMINA REGENERATION

Bernard P. H. Hüe, and Henri A. Mercier, both of Gardanne, France, assignors to Pechiney Ugine Kuhlmann, Paris, France

Filed Nov. 24, 1976, Ser. No. 744,820
Claims priority, application France, Dec. 15, 1975, 75 39408
Int. Cl.³ B05D *1/40*
U.S. Cl. 427—345 **6 Claims**

1. A process of concurrently depositing and regenerating alumina for physical deposition on a metal substrate consisting essentially of immersing the substrate in a circulating aqueous bath solution of alkali metal aluminate containing about 62 g of Na_2O per liter and approximately 96 g of Al_2O_3 per liter; agitating and heating the bath to a temperature of 80° to 100° C., the agitation insuring homogeneity of the bath; maintaining the bath rejuvenated by evaporating the aluminate solution to

concentrate the same as to bring the Na_2O content to 280–290 g per liter, condensing the evaporated water and returning the water condensate to the aluminate bath, heating the concentrated aluminate solution close to to its boiling point and adding alumina to regenerate the same, filtering the regenerated aluminate solution to remove any deposits of impurities and to



eliminate any decomposition seeds from the regenerated aluminate solution, adding water in a quantity substantially equivalent to that which has been evaporated and necessary for keeping the concentration of the aluminate solution at 62 g of Na_2O per liter, and returning the thus regenerated aluminate solution to the original aluminate solution.

4,276,328

IMPREGNATION OF YARNS

David T. Bartram, Stockport, England, assignor to Ferodo Limited, Manchester, England

Filed Oct. 29, 1979, Ser. No. 89,636

Claims priority, application United Kingdom, Nov. 4, 1978, 43249/78

Int. Cl.[3] **B05D** *3/02;* **D02G** *3/00;* **B32B** *25/00, 27/00*

U.S. Cl. 427—381 **3 Claims**

1. A process for the treatment of yarn comprising continuous glass filaments, comprising the steps of:

(1) impregnating the yarn with a low-viscosity solution of a phenol-formaldehyde resin in a lower aliphatic alcohol or ketone solvent, the viscosity of said solution being not greater than 50 centipoise at 25° C.;

(2) evaporating solvent from the impregnated yarn;

(3) further impregnating the yarn with a high viscosity solution of a thermosetting binder in an organic solvent, the viscosity of said solution being at least about 500 centipoise at 25° C.; and again

(4) evaporating solvent from the thus-impregnated yarn.

4,276,329

WOOD TREATMENT PROCESS AND PRODUCT THEREOF

Ramesh C. Vasishth, Danville, Calif., and Dodwell P. deSilva, Vancouver, Canada, assignors to Envirosol Systems International, Ltd., Orinda, Calif.

Continuation-in-part of Ser. No. 23,051, Mar. 22, 1979, abandoned. This application Nov. 5, 1979, Ser. No. 91,030

Claims priority, application Canada, May 16, 1979, 327689

Int. Cl.[3] **B05D** *1/18, 3/02*

U.S. Cl. 427—393 **23 Claims**

1. A method for treating wood to enhance its properties comprising: contacting the wood to be treated with sufficient water dilutable resin in a water miscible solvent to deposit an effective amount of said resin in the cell walls of said wood, said resin containing molecules having a molecular weight of less than about 1000 and of a size which can enter the free space in said cell walls in the presence of said solvent in an amount sufficient to stabilize the wood, and converting the resin in said cell walls to a water insoluble form at ambient conditions.

4,276,330

TRILAMINATE FILM FOR FORMING SIDEWELD BAGS

Hugh E. Stanley, Lafayette, and George M. Tokos, San Leandro, both of Calif., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Continuation of Ser. No. 734,853, Oct. 22, 1976, abandoned. This application Oct. 26, 1977, Ser. No. 845,526

Int. Cl.[3] **B32B** *27/08;* **B65D** *64/40*

U.S. Cl. 428—35 **7 Claims**

1. A trilaminate film made by coextrusion comprising a core layer sandwiched between skin layers, the core layer having a thickness of from about 30 to 90 percent of the thickness of the film and consisting essentially of an ethylene-propylene block copolymer and up to 40 percent of the weight of the film of recycled trilaminate trim consisting of said core layer and said skin layers, the block copolymer being the homogeneous product resulting from the sequential polymerization of (1) propylene and (2) a mixture of propylene and ethylene in the presence of a stereospecific polymerization catalyst, with the ethylene content of the block copolymer being from about five to ten mole percent, each skin layer having a thickness of from about 5 to about 35 percent of the thickness of the film and consisting essentially of polypropylene or an ethylene-propylene random copolymer having an ethylene content up to about four mole percent.

4,276,331

METAL-CERAMIC COMPOSITE AND METHOD FOR MAKING SAME

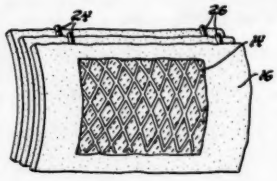
Bruce E. Bothwell, West Bloomfield, Mich., assignor to Repwell Associates, Inc., Bloomfield Hills, Mich.

Division of Ser. No. 652,008, Jan. 26, 1976, Pat. No. 4,059,712. This application Nov. 16, 1977, Ser. No. 852,128

The portion of the term of this patent subsequent to Nov. 22, 1994, has been disclaimed.

Int. Cl.[3] **B32B** *17/00;* **D03D** *13/00;* **B05D** *3/02;* **C04B** *33/34*

U.S. Cl. 428—36 **12 Claims**

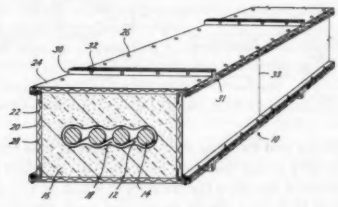


1. An internal combustion engine component having low thermal conductivity so as to provide insulation in a high temperature engine environment, said component comprising: a rigid wall of the engine component which is subjected to thermal cycling and thermal differentials as well as mechanical shock and vibration during operation of an associated engine, a liner adjacent the wall for providing thermal and acoustical insulation thereto, said insulating liner including a monolithic layer of ceramic material formed from a slurry and having imbedded therein a metal grid including openings which are closed by said ceramic material, and said metal grid having a melting temperature higher than the temperature at which the slurry forms into said monolithic ceramic layer and said metal grid having a higher coefficient of thermal expansion than the ceramic material.

4,276,332
FIRE PROOF CABLE TRAY ENCLOSURE

George K. Castle, 1047 E. Lakeview Dr., Baton Rouge, La. 70808

Filed Nov. 6, 1979, Ser. No. 91,839
Int. Cl.[3] B32B *3/20, 3/24*
U.S. Cl. 428—36 11 Claims



8. A fire protective insulating product having an assemblable unit comprising:

an essentially rectangular galvanized metal frame, at least two opposite sides thereof being angularly shaped,

a wire mesh covering at least one side of, and attached to, said metal frame,

said wire mesh being encapsulated by at least three-sixteenth's inch intumescent material,

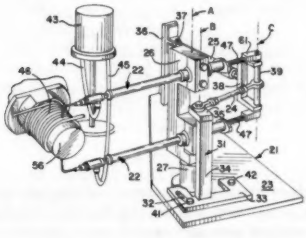
an insulative layer of an inorganic, non-combustible fiber mat being attached to at least one side of said metal frame, and

a metal foil layer secured to said assemblable unit as the last layer thereof.

4,276,333
APPARATUS AND METHOD FOR SOLVENT ADHESION OF COILED TUBING, AND PRODUCT PRODUCED THEREBY

Richard W. Cobean, Libertyville, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 22, 1979, Ser. No. 87,075
Int. Cl.[3] D02G *3/00*
U.S. Cl. 428—36 21 Claims



1. An apparatus for manufacturing coiled tubing having adjacent turns thereof detachably adhered together, comprising:

means for supplying a length of tubing would about an axis into a generally cylindrical coil of tubing having individual turns positioned generally adjacent to each other, said individual turns being detached from each other along their adjacent sides;

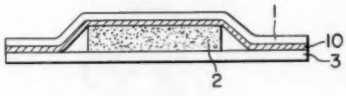
means for automatic silmultaneous tracking and dispensing of a solvent stream onto said generally cylindrical coil of tubing, the tracking means of said tracking and dispensing means having a narrow orifice that traverses said coil of tubing generally along a path connecting adjacent turns of said coil of tubing, the dispensing means of said tracking and dispensing means being pivotally mounted, the dispensing means providing a substantially uninterrupted narrow stream of said solvent through said narrow orifice while said tracking means is in operation, said dispensing means including a supply of said solvent and mechanical means for applying mechanical pressure to said supply of solvent to pass said solvent through said narrow orifice;

said tracking and dispensing means including mechanical means for applying said mechanical pressure to said dispensing means while automatically synchronizing said tracking of said narrow orifice along said coil of tubing, whereby a narrow stream of solvent dissolves at least a portion of the adjacent sides of the individual turns of the coil and detachably adheres together said portions of the adjacent sides, said solvent being applied in an amount that is uniform per turn of tubing.

4,276,334
PRESSURE SENSITIVE RECORDING SHEET

Tetsuo Sugihara, Nara, Japan, assignor to General Company Limited, Tokyo, Japan

Continuation of Ser. No. 736,536, Oct. 28, 1976, abandoned, which is a continuation of Ser. No. 589,877, Jun. 24, 1975, abandoned. This application Nov. 27, 1978, Ser. No. 963,747
Claims priority, application Japan, Oct. 31, 1974, 49/124589; Jan. 31, 1975, 50/12421; Jan. 31, 1975, 50/12422
Int. Cl.[3] G11B *5/62*
U.S. Cl. 428—40 9 Claims

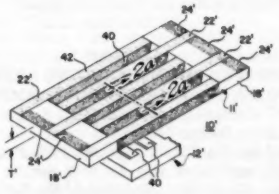


1. A pressure sensitive recording sheet consisting of a single opaque pressure clarifiable layer composed only of non-porous unbaked polytetrafluoroethylene, a support sheet under said pressure clarifiable layer, and a layer of adhesive disposed between said pressure clarifiable layer and said support sheet, either one of said layer of adhesive or said support sheet having a color contrasting with the color of said pressure clarifiable layer.

4,276,335
ELECTRON BEAM MATRIX DEFLECTOR AND METHOD OF FABRICATION

Charles Q. Lemmond, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 885,902, Mar. 13, 1978, Pat. No. 4,182,010. This application Jul. 27, 1979, Ser. No. 61,452
Int. Cl.[3] B32B *3/10;* H01J *9/18*
U.S. Cl. 428—131 3 Claims



1. A matrix assembly for deflecting an electron beam, comprising:

first and second members of insulating material, each of said first and second members having a pair of spaced-apart

and opposed end portions and a plurality of substantially parallel slots formed therethrough to define a plurality of bars extending between said spaced, opposed end portions; each slot having a cross section through said member substantially continuously diverging in a direction of passage of the electron beam therethrough; and

an electrical conductive coating fabricated upon at least the diverging walls of each adjacent pair of bars defining one of said slots;

said first and second members being positioned in overlapping parallel planar relationship to one another with the slots thereof mutually orthogonal each to the other and to the direction of passage of said electron-beam therethrough, to define a matrix of apertures.

4,276,336

MULTI-APERTURED WEB WITH INCREMENTAL ORIENTATION IN ONE OR MORE DIRECTIONS

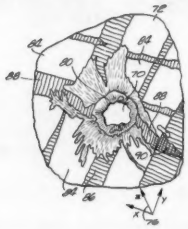
Reinhardt N. Sabee, Appleton, Wis., assignor to Sabee Products, Inc., Appleton, Wis.

Filed Apr. 23, 1979, Ser. No. 32,067

The portion of the term of this patent subsequent to May 8, 1996, has been disclaimed.

Int. Cl.[3] B28B *1/48;* B32B *3/10*

U.S. Cl. 428—132 **4 Claims**



1. A perforated web formed by the process of differentially drawing a web with a quilted pattern of cold drawn areas surrounding undrawn islands comprising the steps of providing a web having at least in part cold drawable polymeric material, perforating the web to provide a pattern of spaced apertures and drawing the web in a first direction and providing a pair of meshing gears having a tooth form to provide rolling contact of the teeth at the pitch circles to provide incremental squeezing and cold stretching of the web while below a heat softened state between meshing teeth along a line of action for more than one tooth wherein the relative tooth height of the teeth on the gears is between 2 and 29 and wherein the relative tooth height is equal to the tooth height in inches divided by the original undrawn web thickness in inches and the teeth being at a transverse angle relative to the direction of draw in the first direction and moving a web through the gears to provide stretched and unstretched zones including generally polygonal shaped undrawn islands.

4,276,337

REINFORCED PLASTIC GRATING ARTICLES AND CONTINUOUS PROCESS FOR FORMING SAME

William C. Coonrod, Richardson, Tex., assignor to Fibergrate Corporation, Dallas, Tex.

Division of Ser. No. 889,392, Mar. 23, 1978, Pat. No. 4,164,439. This application Mar. 13, 1979, Ser. No. 20,164

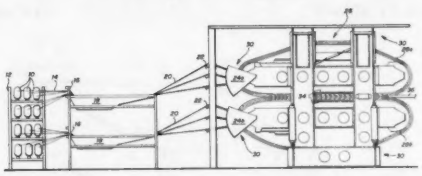
Int. Cl.[3] B32B *3/10;* B65H *81/00;* B29D *7/14*

U.S. Cl. 428—134 **7 Claims**

1. A process for producing fiber reinforced plastic grate structures having longitudinal span bars and transverse tie bars comprising:

(a) feeding continuous strands of resin coated reinforcing fiber into the inlet opening between two continuous molding tracks having molding teeth comprising curved leading edges mounted thereon which mesh to form a molding cavity having longitudinal columns and transverse rows;

(b) alternately rotating said continuous molding tracks to carry said strands longitudinally along the columns between said molding teeth and indexing said strands transversely along the rows between said molding teeth for a distance less than the transverse width of said grate structure to form a plastic reinforced grate structure comprising continuous strands of said fibers laced in a predetermined weaving pattern.



4,276,338

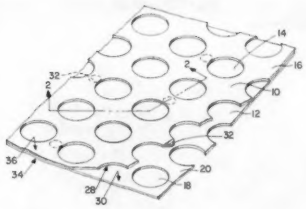
ABSORBENT ARTICLE

Raymond J. Ludwa, Fairfield; Mark E. Forry, Mason, and Marilyn M. Haugen, Fairfield, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 1, 1979, Ser. No. 35,141

Int. Cl.[3] B32B *5/12, 5/14*

U.S. Cl. 428—137 **20 Claims**



1. An absorbent article with improved wicking performance comprising adjacent first and second layers maintained together intimately in a generally parallel arrangement to form a unitary structure:

(A) Said first layer comprising a sheet of fibrous material having opposed major surfaces and having multiple discrete regions of low density which penetrate said first layer, and which are separated by regions of high density;

(B) Said second layer comprising a sheet of fibrous material having multiple discrete regions of low density which are separated by regions of high density;

wherein 0% of about 58% of the regions of low density of said first layer overlap a region of low density of said second layer;

and wherein said multiple discrete regions of low density are structures selected from cavities, apertures, holes, slits, areas of widely spaced fibers, and areas of few fibers, separated by said regions of high density.

4,276,339
LAMINATED FOAM-CREPED PAPER PRODUCT AND METHOD OF PRODUCTION THEREOF

F. Raymond Stoveken, 28 Meadow La., East Windsor, N.J. 08520

Filed Dec. 3, 1979, Ser. No. 99,513
Int. Cl.[3] B32B *3/28, 5/20*
U.S. Cl. 428—153 19 Claims

1. A method for the production of a laminated foam-creped paper product which exhibits improved wet strength and bulk, and is highly absorbent comprising:

forming an unset and ungelled foamed film of an aqueous dispersion or solution of a film-forming material on at least one surface of creped paper; and

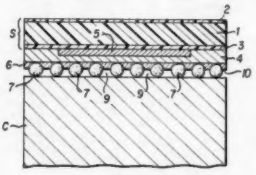
causing said foamed film to set or gel such that the amount of moisture absorbed by the paper from the film prior to the setting or gelling of the film is insufficient to cause the crepe in the paper to be released whereupon a laminate is formed having a set or gelled foamed film having a thickness of from about 1 to about 125 mils which is bonded to said creped paper.

15. A laminated paper product produced according to the method of claim 1.

4,276,340
CELLULOSE PACKAGING FILMS FOR PACKAGING SOFT CHEESES

Jean-Pierre de Leiris, Creteil, France, assignor to La Cellophane, Paris, France

Filed Jun. 27, 1979, Ser. No. 52,812
Claims priority, application France, Jul. 7, 1978, 78 20248
Int. Cl.[3] B32B *3/00, 27/14;* B05D *5/00;* B65B *55/00*
U.S. Cl. 428—166 10 Claims



1. A water vapor permeable cellulose packaging film especially adapted for packaging soft cheeses which comprises

a cellulose film support; and

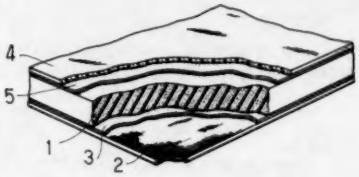
a nitrocellulose varnish layer coated on said support, said varnish layer containing particles of casein or starch dispersed throughout said layer, said particles having a diameter greater than the thickness of said varnish layer.

4,276,341
WET SUIT MATERIAL AND WET SUIT MADE THEREOF

Kazuyoshi Tanaka, Kobe, Japan, assignor to Kabushiki Kaisha Asahi Gomu, Kobe, Japan

Filed Oct. 22, 1979, Ser. No. 87,268
Claims priority, application Japan, May 2, 1979, 54-58304[U]; Jun. 1, 9179, 54-68571
Int. Cl.[3] B32B *7/02, 7/12, 5/18*
U.S. Cl. 428—246 8 Claims

7. A wet suit formed of a closed pore, continuous, synthetic rubber sponge sheet, said sponge sheet being of white chloroprene rubber, a nylon stretch fabric adhesively bonded with a chloroprene-type adhesive to the interior surface of said synthetic rubber sponge sheet, a polyurethane film fixed by adhesive bonding with a urethane-type or chloroprene-type adhesive exteriorly of the synthetic rubber sponge sheet and forming the exterior surface of the wet suit, said polyurethane film having a thickness in the range of 0.01 mm to 0.05 mm and being a colored polyurethane film, the brightness of which is enhanced by the white sponge sheet backing same, said stretch fabric and sponge sheet and polyurethane film being substantially coextensive in area and forming a continuous laminate wherein said sponge sheet provides a substantially unbroken exterior support surface for said polyurethane film.

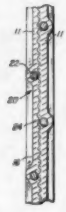


8. A wet suit as claimed in claim 7 and further comprising a second stretch fabric adhesively bonded between said synthetic rubber sponge sheet and said polyurethane film, with said second stretch fabric being a thin stretch cloth having a better stretchability than said first-mentioned stretch fabric.

4,276,342
MOISTURE PROOF MATTING

Elwood O. Johnson, Box 773, Casa Grande, Ariz. 85222

Filed Jun. 7, 1979, Ser. No. 46,215
Int. Cl.[3] B32B *7/00*
U.S. Cl. 428—247 2 Claims



1. A reinforced moisture proof impervious flexible sheet material comprising in combination:

(a) a first bendable mesh for providing primarily structural support for said sheet material, said first mesh including a first plurality of unbroken continuous crossed elements of a first cross-section and extending intermediate the respective edges of said sheet material, said cross elements defining first sized voids in said first mesh;

(b) a second bendable mesh juxtaposed with said first mesh for dividing each of the first sized voids into a plurality of second sized voids, said second mesh including a second plurality of unbroken continuous crossed elements of a second cross-section and extending intermediate the respective edges of said sheet material;

(c) at least one coating of a flowable curable tar compound for encapsulating and only incidentally penetrating said first and second plurality of elements of said first and second meshes, respectively, and for preventing relative movement of said first and second plurality of elements relative to one another at their respective intersections;

(d) said sheet material including an undulating surface formed by said tar compound on opposed sides of said sheet material and extending across said second sized voids intermediate said second plurality of elements of said second mesh which surface conforms with the outline of said tar compound encapsulated first plurality of elements, said second plurality of elements, said first sized voids, said second sized voids and their relative thicknesses and interstices;

whereby, said non-smooth surfaced sheet is impervious and bendingly conformable to various curvatures through bending of said first and second plurality of elements without relative movement therebetween at their respective interstices.

4,276,343

ACTIVE PHOSPHORUS NITRIDES CONTAINING HYDROXYL AND HALOGEN, AND PROCESS FOR MAKING THEM

Joseph Cremer, Hurth, and Heink Harnisch, Cologne, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 10, 1980, Ser. No. 128,385

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1979, 2909600

Int. Cl.[3] **B32B** *7/00;* **D04B** *1/00;* **C01B** *21/06, 25/00*

U.S. Cl. 428—254 **8 Claims**

1. Active polymeric phosphorus nitrides containing hydroxyl and halogen, the halogen atoms and hydroxyl groups being linked to phosphorus, the nitrides containing about 37 to 48 weight% of phosphorus, about 39 to 44 weight% of nitrogen, about 4 to 12 weight% of oxygen and about 2 to 10 weight% of chlorine.

8. Light knitted goods of fibers of regenerated cellulose containing, as a flame-retardant agent, an active polymeric phosphorus nitride containing hydroxyl and halogen as claimed in claim **1**.

4,276,344

PHOSPHORUS-CONTAINING BISIMIDE RESINS

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Indra K. Varma, George M. Fohlen, John A. Parker

Filed Aug. 5, 1980, Ser. No. 175,452

Int. Cl.[3] **B32B** *7/00*

U.S. Cl. 428—260 **6 Claims**

1. A bisimide obtained by the condensation reaction of a polymerizable ethylenically unsaturated cyclic anhydride with a phosphorus-containing diamine of the formula

in which R stands for a methyl, ethyl, or phenyl group.

4,276,345

METHOD FOR PREVENTING A SURFACE EXIT OF FIBERS FROM AN UNWOVEN FABRIC, THROUGH A VERY THIN LAYER OF EMULSIFIED LATEX, AND PRODUCT THEREBY OBTAINED

Marco Maranghi, Prato, Italy, assignor to Prato Commerz, S.p.A., Prato, Italy

Filed Jul. 9, 1979, Ser. No. 56,067

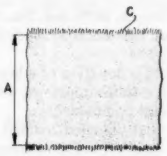
Int. Cl.[3] **B05D** *3/00;* **B32B** *27/34*

U.S. Cl. 428—284 **6 Claims**

1. In a process for preventing surface-hairiness and surface exit of fibers from a non-woven fabric which comprises the step of applying to the surface of the fabric an emulsion latex of an acrylic or butadieneacrylonitrile resin the improvement which comprises the steps of

(a) impregnating the non-woven fabric with a solution of an emulsion-destabilizing electrolyte salt,

(b) spreading onto the surface of the impregnated fabric a layer of an emulsion latex of the resin, which layer is of



sufficiently low thickness not to cause hardening or stiffening of the fabric.

4,276,346

THERMOPLASTICS ARTICLES HAVING A SURFACE FUSED TO CLOTH

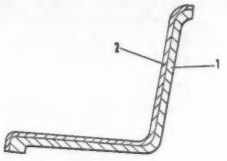
Michael J. Bramwell, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 963,051, Nov. 22, 1978, Pat. No. 4,186,235, which is a continuation of Ser. No. 762,161, Jan. 24, 1977, abandoned, which is a continuation of Ser. No. 679,493, Apr. 22, 1976, abandoned. This application Aug. 14, 1979, Ser. No. 66,325

Claims priority, application United Kingdom, Apr. 24, 1975, 17059/75

Int. Cl.[3] **B32B** *27/00*

U.S. Cl. 428—286 **4 Claims**



1. A molded thermoplastics shaped article having a surface region keyed into a piece of cloth which is non-woven cloth having a thickness of at least 0.6 mm and weight of 50 to 250 g/m^2 wherein the cloth comprises contiguous fibres at least some of which are fused together at at least some of the points where they touch one another.

4,276,347

REINFORCED RESINOUS LAMINATE

Koji Shimada, Fujisawa, and Seiji Koike, Yokosuka, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd. and Kabushiki Kaisha Takeda Sangyo, both of Tokyo, Japan

Continuation-in-part of Ser. No. 860,384, Dec. 14, 1977, abandoned. This application Aug. 20, 1979, Ser. No. 68,054

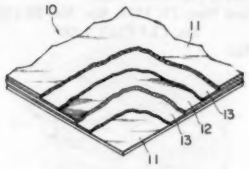
Claims priority, application Japan, Dec. 25, 1976, 51/178841

Int. Cl.[3] **B32B** *7/00, 27/06, 27/32*

U.S. Cl. 428—332 **2 Claims**

1. A reinforced laminate comprising two strips of polyethylene film, a strip of annealed aluminum foil of between about 7 to 15 microns in thickness interlaid between the strips, an adherent coating on both surfaces of the annealed aluminum foil to bond the annealed aluminum foil and the polyethylene

strips together, the polyethylene strips each being oriented at an angle of 45 degrees to the longitudinal direction of the



laminate and forming a ninety degree angle relative to one another.

4,276,348

HIGH TENACITY POLYETHYLENE FIBERS AND PROCESS FOR PRODUCING SAME

Wen-li Wu, and William B. Black, both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 848,168, Nov. 3, 1977, Pat. No. 4,228,118. This application Jan. 7, 1980, Ser. No. 109,954

Int. Cl.³ D02G *3/00*

U.S. Cl. 428—373 **6 Claims**

1. Fibers consisting of a polyethylene having a $\overline{M}_n$ of at least 20,000, a $\overline{M}_w$ of less than 125,000, a density of between 0.92 and 1.00 grams per cubic centimeter, said fibers having a tenacity of at least 12 grams per denier and a modulus of at least 272 grams per denier when measured at 72% relative humidity and 25° C. on a bundle of at least 8 filaments using a gauge length of at least 25 centimeters.

4,276,349

ROUND MULTI-LAYERED CALCIUM HYPOCHLORITE GRANULES

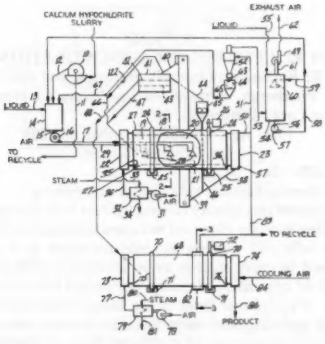
Walter C. Saeman, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 521,417, Nov. 6, 1974, abandoned, which is a continuation-in-part of Ser. No. 276,615, Jul. 31, 1972, abandoned. This application Mar. 12, 1979, Ser. No. 19,950

The portion of the term of this patent subsequent to Jul. 13, 1993, has been disclaimed.

Int. Cl.² C01B *11/06*

U.S. Cl. 428—403 **6 Claims**



1. Granular dust resistant calcium hypochlorite particles

(a) each of said particles having a smooth, rounded surface, said particles being comprised of

(1) a solid core of calcium hypochlorite which ranges in diameter from about 200 to about 2,000 microns,

(2) encapsulated with a plurality of individual layers of calcium hypochlorite,

(a) wherein the outside diameter of said layers ranges from about 400 to about 5,000 microns,

(b) each of said layers being substantially free of sharp fragile edges,

(b) the calcium hypochlorite content of said particles ranges from about 50 to about 85 percent by weight,

(c) said layers of calcium hypochlorite being derived from an aqueous slurry of calcium hypochlorite dihydrate crystals in an aqueous solution of dissolved salts, and

(d) on a dry basis, from about 27 to about 55 percent by weight of said calcium hypochlorite particles is derived from said dissolved salts originally present in said aqueous slurry.

4,276,350

FLUOROCARBON TREATMENT FOR REDUCING THE REACTIVITY OF A GLASS SURFACE AND PRODUCT

Helmut Franz, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 13, 1979, Ser. No. 65,797

Int. Cl.³ B32B *17/00*

U.S. Cl. 428—410 **10 Claims**

1. A method for treating a glass surface comprising the steps of:

a. contacting the glass surface with a solution comprising multivalent metal cations capable of adsorption onto the glass surface at a temperature below the boiling point of the solution; and

b. contacting the glass surface, subsequent to the adsorption of the multivalent metal cations, with a fluorocarbon capable of chemisorption by the metal cation treated glass surface.

10. A glass article produced according to the method of claim **1**.

4,276,351

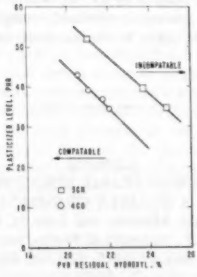
POLYVINYL BUTYRAL PLASTICIZED WITH TETRAETHYLENEGLYCOL DI-2-ETHYLHEXANOATE

Thomas R. Phillips, Belpre, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 30, 1980, Ser. No. 164,140

Int. Cl.³ C08F *45/38*; B32B *17/10, 27/42*

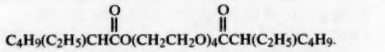
U.S. Cl. 428—437 **7 Claims**



1. A plastic composition comprising polyvinyl butyral and, in compatible admixture therewith, a plasticizer comprising at least about 10 weight percent tetraethyleneglycol di-2-ethylhexanoate of the formula:

$$C_4H_9(C_2H_5)CHCO(CH_2CH_2O)_4CCH(C_2H_5)C_4H_9$$

6. A laminar structure comprising at least one layer of glass and a layer of a plastic composition comprising polyvinyl butyral and, in compatible admixture therewith, a plasticizer comprising at least about 10 weight percent tetraethyleneglycol di-2-ethylhexanoate of the formula:



$$C_4H_9(C_2H_5)CHCO(CH_2CH_2O)_4CCH(C_2H_5)C_4H_9$$

4,276,352

REINFORCED COMPOSITES CONTAINING UNSATURATED POLYIMIDE RESINS

George E. Green, Stapleford, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 910,403, May 30, 1978, abandoned. This application Oct. 22, 1979, Ser. No. 87,138

Claims priority, application United Kingdom, Jun. 1, 1977, 23174/77

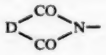
Int. Cl.³ B32B *27/06;* **C08F** *8/00;* **C08G** *23/10*

U.S. Cl. 428—473.5 **28 Claims**

1. A thermosettable composite comprising:

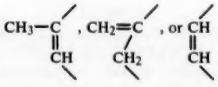
(a) a fibrous reinforcing material,

(b) a heat-curable polyimide resin containing, per average molecule, at least two groups of formula



I

directly attached to carbon atoms, where D denotes



(c) an effective amount of a heat-activated curing agent for said polyimide resin, and

(d) a photopolymerised compound, prepared from the photo-polymerization of a composition comprising 0.1 to 10 moles of a photopolymerizable compound per mole of said polyimide resin, in the presence of components (b) and (c).

4,276,353

SELF-BONDING FLAME SPRAY WIRE FOR PRODUCING A READILY GRINDABLE COATING

Edward R. Novinski, Mineola, and John H. Harrington, Warwick, both of N.Y., assignors to Metco, Inc., Westbury, N.Y.

Filed Aug. 23, 1978, Ser. No. 936,169

Int. Cl.³ B32B *15/02*

U.S. Cl. 428—558 **8 Claims**

1. A self-bonding flame spray wire capable of forming a readily grindable coating, comprising a sheath of aluminum and a compacted powder core containing about 10 to 90% by weight of nickel, about 10 to 90% by weight of stainless steel, about 1 to 10% aluminum, and about ¼ to 10% metal oxide, based on the total powder compacted core, said stainless steel and metal oxide content being in sufficient quantity and proportions that when sprayed will produce a readily grindable coating.

4,276,354

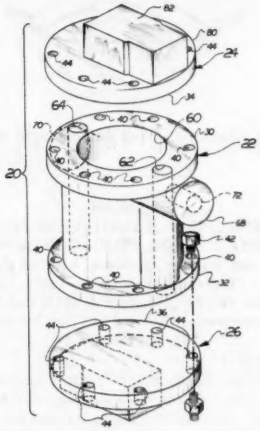
STEAM TRAPS OR THE LIKE

Michael E. Winiasz, Lorain, Ohio, assignor to The Clark-Reliance Corporation, Cleveland, Ohio

Filed Nov. 19, 1979, Ser. No. 95,152

Int. Cl.³ F16T *1/00*

U.S. Cl. 428—582 **12 Claims**



1. A housing adapted to receive any chosen one of a plurality of different valve assemblies for controlling fluid flow from an inlet conduit through said housing to an outlet conduit, said housing comprising top and bottom members and a main body with walls defining a central passage extending between said top and bottom members, said top and bottom members being fastened to said main body and sealing the ends of said central passage, said main body including walls defining at least one additional internal passage extending between said top and bottom members, said top and bottom members being identical and having portions selectively removable in accordance with the one of the plurality of different valve assemblies chosen to be received in said housing to establish fluid communication between said additional passage and said central passage in said main body, said main body and said top and bottom members each having wall portions selectively removable to provide means for connecting the inlet and outlet conduits to said housing.

4,276,355

FUEL CELL SYSTEM CONFIGURATIONS

Richard E. Kothmann, Churchill Borough, and Joseph A. Cyphers, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 28, 1980, Ser. No. 144,089

Int. Cl.³ H01M *8/06*

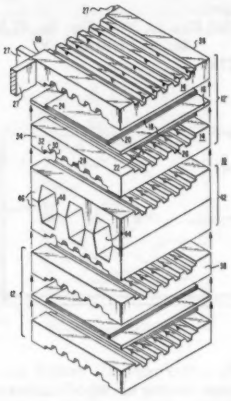
U.S. Cl. 429—26 **15 Claims**

1. An electrochemical cell system comprising:

a plurality of electrically connected fuel cells and at least one cooling module disposed between selected fuel cells, said fuel cells and cooling module arranged in a stack and shaped in cross section as an elongated polygon having pairs of oppositely disposed peripheral faces, at least one pair of peripheral faces being longer than the remaining pairs and disposed such that the distance between said opposite longer pair of peripheral faces is shorter than the distance between the opposite peripheral faces of the remaining pairs;

each said fuel cell having an electrolyte positioned between a pair of bipolar plates, said bipolar plates defining oxidant channels for transporting an oxidant in reacting communication with said electrolyte, and fuel channels for trans-

porting a fuel in reacting communication with said electrolyte, said fuel and oxidant channels each having an inlet on one shorter peripheral face of said polygon and an outlet on an opposite shorter peripheral face;



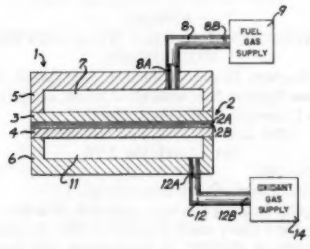
said cooling module having cooling passages, said passages having an entry on one peripheral face of said polygon and an exit on an opposite peripheral face, said entry and exit being disposed on said longer peripheral faces of said polygon.

4,276,356

MATRIX MEMBER FOR CONTAINING FUEL CELL ACID ELECTROLYTE

Bernard S. Baker, Brookfield Center, Conn., assignor to Energy Research Corporation, Danbury, Conn.

Filed Mar. 27, 1979, Ser. No. 24,416
Int. Cl.³ H01M 8/02
U.S. Cl. 429—41 **17 Claims**



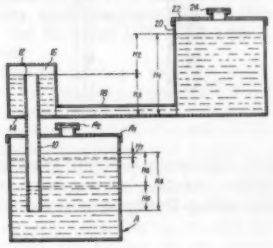
1. A fuel cell comprising:
an anode electrode;
a cathode electrode;
each of said electrodes including a waterproofing binder;
an electrolyte;
and a matrix member carrying said electrolyte and disposed between said anode and cathode electrodes, said matrix member having a layer having a mean pore size which is substantially equal to or less than the mean pore size of said cathode electrode.

4,276,357

DEVICE FOR SELF-LEVELING OF ELECTROLYTE IN ELECTRIC ACCUMULATORS

Franco Ferrarini, Milan, Italy, assignor to Fabbrica Italiana Magneti Marelli S.p.A., Italy

Filed Jan. 18, 1980, Ser. No. 113,377
Claims priority, application Italy, Jan. 26, 1979, 19616 A/79
Int. Cl.³ H01M 2/00
U.S. Cl. 429—63 **23 Claims**



1. A device for self-levelling and topping up electrolyte in an accumulator battery, comprising:
an accumulator container for containing electrolyte;
a pneumatic chamber and means for providing topping up liquid to the pneumatic chamber at a predetermined pressure;
a conduit communicating from the pneumatic chamber to the accumulator container; a top of the conduit extending a distance up into the pneumatic chamber such that when the liquid in the pneumatic chamber rises above the top of the conduit, liquid enters the conduit from the pneumatic chamber; the conduit being oriented such that when liquid enters the conduit at the top thereof, it moves into the accumulator container and increases the level of filling of the accumulator container;
a bottom of the conduit extending a distance into the accumulator container such that as the liquid level in the accumulator container increases above the height of the bottom of the conduit, this generates a back pressure in the conduit which, in turn, generates a back pressure in the pneumatic chamber above the liquid in the pneumatic chamber;
whereby when the level of liquid in the accumulator container declines, this reduces the back pressure in the pneumatic chamber, and the liquid level in the pneumatic chamber increases due to the providing means providing liquid to the pneumatic chamber until the level of liquid in the pneumatic chamber rises enough for liquid to enter the top of the conduit and to move through the conduit into the accumulator container; and as the level of liquid in the accumulator container increases above the bottom of the conduit and the back pressure in the conduit thereby increases, the liquid level in the pneumatic chamber is decreased below the top of the conduit, stopping entrance of liquid into the conduit.

4,276,358

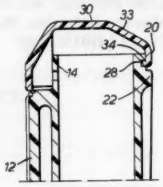
ELECTRIC BATTERIES

Kenneth Henson, Bury, and Christopher Terrell, London, both of England, assignors to Chloride Group Limited, London, England

Filed Feb. 25, 1980, Ser. No. 124,516
Claims priority, application United Kingdom, Mar. 7, 1979, 08034/79
Int. Cl.³ H01M 2/04
U.S. Cl. 429—97 **15 Claims**

1. An electric battery having at least one cell, a single container, an inner lid and an outer lid, said container containing said at least one cell and being sealed by said inner lid and also

having said outer lid secured thereto, said container and said outer lid each affording on one side of said battery one of a horizontal groove and a projecting rib, said rib being accommodated in said groove, and on the opposite side of said battery a respective substantially horizontal engagement surface, said battery further including fastening means engaging said two engagement surfaces thereby securing said outer lid to said container.

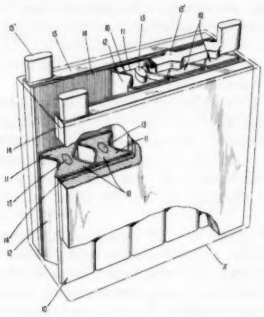


4,276,359

LEAD-ACID BATTERY WITH TUBULAR PLATE ELECTRODE

Erik Sundberg, Newtown Crossing, Pa., assignor to Koehler Manufacturing Company, Marlborough, Mass.

Filed May 25, 1979, Ser. No. 42,632
Claims priority, application Sweden, Sep. 1, 1978, 7809214
Int. Cl.³ H01M 2/18
U.S. Cl. 429—140 **2 Claims**



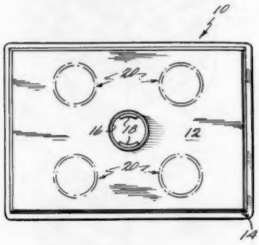
1. An electrical accumulator of the sealed type comprising positive and negative electrode plates and a separator therebetween, said plates and separator being kept pressed together under pressure to force oxygen through the separator during charging for reaction with the negative plate, said positive plate comprising a row of immediately adjacent tubes formed of porous fibrous material having a shape such that the ratio of volume to surface area of active material is no greater than 0.20 times the thickness of the tube taken in a direction between the ends of the tube which face the negative electrodes, said separator having a thickness in said direction no greater than substantially 1 mm., the sides of said tubes being of concave configuration to define electrolyte-containing channels, wherein the total amount of electrolyte contained within said channels is at least 10% of the total electrolyte within the accumulator, with substantially all of the electrolyte which reacts with said positive electrode having to pass through said concave sides, said tubes including substantially straight end walls which are joined by said concave sides and which are pressed against said separators.

4,276,360

BATTERY JAR COVER AND WELDING METHOD THEREFOR

James S. Hardigg, and Joseph C. Strzegowski, Jr., both of Conway, Mass., assignors to Hardigg Industries, Inc., South Deerfield, Mass.

Filed Oct. 22, 1979, Ser. No. 87,149
Int. Cl.³ H01M 2/08
U.S. Cl. 429—175 **25 Claims**



1. A cover for a thermoplastic battery jar comprised of a thermoplastic plate member having a predetermined thickness, top and bottom surfaces and four edges, a plurality of means defining openings extending through said plate member, and guide means for engaging and aligning the interior of a battery jar therewith and for defining weldable surfaces on said cover, said guide means positioned at least at predetermined spaced apart locations around said plate member and extending downwardly away from said bottom surface a first predetermined distance and spaced inwardly a second predetermined distance from said edges, said guide means having an outer surface in contact with (at least a portion of which contacts) the interior of said jar serving to define a plurality of gaps at predetermined positions around said jar and interiorly thereof when said cover is placed on the jar.

24. A cover capable of being welded onto a battery jar comprised of a plate member having top and bottom surfaces and four edges, means defining a plurality of openings extending through said plate member, and guide means for aligning the cover with the battery jar and for defining a plurality of spaced apart open areas interiorly of the area where the cover and jar are welded together exposing the interior surface of the battery jar adjacent the weld area when the cover is positioned on the battery jar.

4,276,361

ELECTROCHEMICAL CELL WITH ELECTRODE HOLD-DOWN

Robert J. Boudrot, Falmouth; John S. Shambaugh, Holliston, and Hyman Zeltzer, Needham, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 26, 1980, Ser. No. 163,242
Int. Cl.³ H01M 2/10
U.S. Cl. 429—186 **12 Claims**

1. An electrochemical cell comprising:

a rectangular housing having a plurality of walls;

a rectangular battery stack disposed within the housing and comprising a plurality of rectangular cell components lying within corresponding planes;

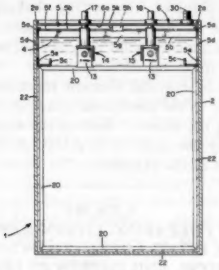
a top cover assembly secured to the housing above the battery stack and having an inner surface;

an electrolytic solution within the housing in contact with the battery stack; and

a generally-rectangular hold-down unit intermediate to the battery stack and the top cover assembly and in abutment with the battery stack and the top cover assembly, said hold-down unit comprising:

first and second opposed end sections disposed on the battery stack across the planes of the cell components thereof; and

first and second opposed connecting sections spaced from the battery stack and interconnecting the first and second end sections, said first and second end sections and said first and second connecting sections defining a top opening adjacent to the inner surface of the top cover assembly and side openings adjacent to walls of the housing, and said first and second end sections further



having openings therein for minimizing, together with the aforesaid top and side openings, the displacement of electrolytic solution in the region of the housing above the battery stack;

one of said pairs of sections further including contact portions in abutment with the inner surface of the top cover assembly.

4,276,362

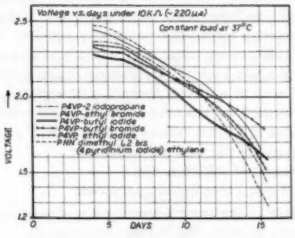
DEPOLARIZERS FOR LITHIUM HALIDE BATTERIES

Marilyn J. Harney, Murrysville, Pa., assignor to Catalyst Research Corporation, Baltimore, Md.

Filed Sep. 7, 1979, Ser. No. 73,188

Int. Cl.³ H01M *4/60*

U.S. Cl. 429—213 **13 Claims**



1. A depolarizer for use in a lithium halide battery comprising a charge transfer complex consisting of an organic component and a halogen, the halogen being present in excess of stoichiometric, the organic component being selected from the group consisting of phenyl methane dyes and said halogen being present in an amount of from 3:1 to 50:1 parts (by weight) for each part of organic component.

4,276,363

PROCESS FOR FORMING PHOSPHOR SCREENS WITH TREATED PHOSPHORS

Toshikatsu Manabe, Ome; Saburo Nonogaki; Hajime Morishita, both of Tokyo; Shoichi Uchino, Hachioji; Yoshifumi Tomita, Mobara; Masahiro Nishizawa, Mobara; Hiroshi Yokomizo, Mobara, and Susumu Ohmatoi, Fujisawa, all of Japan, assignors to Hitachi, Ltd. and Kasei Optonix, Ltd., both of Tokyo, Japan

Filed Oct. 19, 1979, Ser. No. 86,445

Claims priority, application Japan, Oct. 25, 1978, 53-130523

Int. Cl.³ G03C *5/00*; B05D *5/06*

U.S. Cl. 430—28 **22 Claims**

1. In a process for forming a phosphor screen of a color picture tube by a dry phosphor deposition method comprising coating a photosensitive composition, which contains an aromatic diazonium salt or a mixture of an aromatic diazonium salt as a photosensitive component and produces tackiness by exposure to actinic light, on the inner surface of the face plate of a color picture tube to form a thin layer, exposing the thin layer imagewisely to actinic light for producing tackiness on the portions exposed, contacting the exposed thin layer with phosphor particles, and making the thin layer receive the phosphor particles depending on receptive ability of the thin layer to form each phosphor layer for emitting color, the improvement which comprises using as the phosphor particles those coated with at least one surface coating material selected from the group consisting of $Zn(OH)_2$, $Zn_3(PO_4)_2$ and $AlPO_4$, whereby the amount of time necessary for the phosphor to contact the thin layer to provide said each phosphor layer thereon is shortened.

4,276,364

ACYLHYDRAZINOPHENYLTHIOUREA NUCLEATING AGENTS AND PHOTOGRAPHIC EMULSIONS AND ELEMENTS CONTAINING SUCH AGENTS

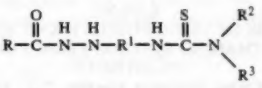
Ronald E. Leone, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 122,151, Feb. 19, 1980, abandoned, which is a continuation-in-part of Ser. No. 56,588, Jul. 11, 1979, abandoned. This application Jun. 23, 1980, Ser. No. 161,708

Int. Cl.³ G03C *1/06, 5/54, 1/40, 1/48*

U.S. Cl. 430—212 **23 Claims**

1. A silver halide emulsion comprised of silver halide grains capable of forming an internal latent image and, adsorbed to the surface of said silver halide grains, a nucleating amount of a 3,3-disubstituted acylhydrazinophenylthiourea of the formula



wherein

R is hydrogen or an alkyl, cycloalkyl, haloalkyl, alkoxyalkyl or phenylalkyl substituent,

R^1 is a phenylene or alkyl, halo-, or alkoxysubstituted phenylene group, and

R^2 and R^3 are independently selected from among alkyl, haloalkyl, alkoxyalkyl, or phenylalkyl substituents having from 1 to 18 carbon atoms, a cycloalkyl substituent; a phenyl nucleus having a Hammett sigma value-derived electron-withdrawing characteristic less positive than +0.50, and naphthyl, or R^2 and R^3 together form a heterocyclic nucleus forming a 5- or 6-membered ring, wherein the ring atoms are chosen from the class consisting of nitrogen, carbon, oxygen, sulfur and selenium atoms,

the alkyl moieties, except as otherwise noted, in each instance include from 1 to 6 carbon atoms and the cycloalkyl moieties have from 3 to 10 carbon atoms.

4,276,365

POSITIVE RESIST TERPOLYMER COMPOSITION AND METHOD OF FORMING RESIST PATTERN

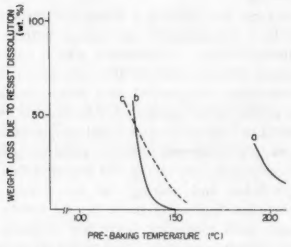
Yasuhiro Yoneda; Toshisuke Kitakohji, both of Yokohama, and Kenro Kitamura, Fujisawa, all of Japan, assignors to Fujitsu Limited, Japan

PCT No. PCT/JP 78/00022, § 371 Date Jul. 7, 1979, § 102(e) Date Jul. 2, 1979, PCT Pub No. WO79/00284, PCT Pub Date May 31, 1979

This PCT application filed Nov. 6, 1978, Ser. No. 61,291

Int. Cl.³ G03C *1/68*

U.S. Cl. 430—270 **8 Claims**



1. A cross-linkable positive working resist polymer composition comprising, a terpolymer comprised of

(a) units derived from a methacrylic acid ester of the formula:

$$CH_2=C(CH_3)\text{-}COOR$$

where R is selected from the group consisting of alkyls having from 1 to 6 carbon atoms, haloalkyls having from 1 to 6 carbon atoms, benzyl and cyclohexyl,

(b) units derived from a monoolefinically unsaturated carboxylic acid having from 3 to 12 carbon atoms and from 1 to 3 carboxyl groups, and

(c) units derived from methacrylic acid chloride; the amount of the units (b) being such that the number of moles of the units (b), multiplied by the number of the carboxyl groups in each of the units (b) range from about 1 to about 20% based on the total number of moles of the units (a), (b) and (c); the amount of the units (c) ranging from about 0.05 to about 3.0% by mole based on the total number of moles of the units (a), (b) and (c); and the molar ratio of the units (b), multiplied by the number of the carboxyl groups in each of the units, to the units (c) being greater than 2/1 but less than 250/1.

4,276,366

PROCESS OF USING POSITIVE AND NEGATIVE WORKING IMAGING SYSTEMS FROM PHOTOACTIVE PLASTISOLS

Peter J. McCartin, Princeton Junction, N.J., and William J. Nebe, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 950,307, Oct. 11, 1978. This application Jul. 14, 1980, Ser. No. 168,153

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—291 **11 Claims**

1. A positive image forming process which comprises

(a) exposing imagewise a photoactive element comprising a substrate bearing a layer of a photoactive, thermally coalescible polyvinyl chloride resin plastisol dispersion consisting essentially of (a) particles having a mean diameter in the range of 0.1 to 20 μm of a solid polyvinyl chloride polymer having attached to the backbone thereof photopolymerizable or photocrosslinkable groups taken from the group consisting of anhydrides, carbonyl, carboxyl, isocyanate, methylol and ethylenically unsaturated substituents in amounts of 0.1 to 16% by weight based on the total weight of polymer, the polymer having an inherent viscosity in the range of 0.1 to 1.2 and being dispersed in (b) a liquid medium compatible with the particles that comprises a plasticizer for the polymer and is nonvolatile at room temperature and has no substantial solvent activity for the polymer at room temperature and (c) a photoinitiator or photoinitiator system present either as a separate component or as a photoactive substituent on the polymer backbone, the photoinitiator or photoinitiator system being capable, upon exposure to actinic radiation, of causing polymerization or crosslinking of the photopolymerizable or photocrosslinkable polymer, respectively, the weight ratio of solid polymer (a) to weight ratio of plasticizer (b) being 70/30 to 30/70

(b) heating the exposed element to coalesce the plastisol layer solely in the unexposed image areas, and

(c) removing the plastisol layer in the exposed image areas by washing the areas with a solvent for the plasticizer component of the plastisol.

4,276,367

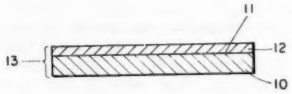
METHOD OF PREPARING LITHOGRAPHIC PRINTING PLATES USING NOVEL COMPOUNDS AND COMPOSITIONS, AND IMPROVED LITHOGRAPHIC PRINTING PLATES

Richard E. Merrill, Wakefield, and Arthur A. Massucco, Natick, both of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Division of Ser. No. 33,194, Apr. 25, 1979, Pat. No. 4,224,399, which is a continuation-in-part of Ser. No. 770,272, Feb. 22, 1977, abandoned, and Ser. No. 958,712, Nov. 8, 1978, which is a division of Ser. No. 770,272, , and Ser. No. 970,196, Dec. 18, 1978, Pat. No. 4,209,582, which is a continuation-in-part of Ser. No. 770,272,. This application Dec. 26, 1979, Ser. No. 107,395

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—302 **23 Claims**



1. A presensitized photolithographic plate, comprising in combination

(a) a backing plate having a hydrophilic/oleophobic surface; and

(b) a photosensitive cross-linkable polymeric film adhered to said hydrophilic surface, said film being no greater than 6μ thick and comprising

(1) a block copolymer formed of blocks of copolyacrylate and polyurethane, said copolyacrylate comprising a copolymer of a hydroxy-containing acrylate and a second acrylate component which comprises one or more esters of a non hydroxy-containing arylic acid or methacrylic acid or mixtures thereof, and said polyurethane being formed by reacting a diisocyanate with polyoxybutylene to form a "diisocyanate-capped" prepolymer constituent of the said polyurethane;

(2) an ultraviolet initiator, and

(3) at least one cross-linking promoter.

4,276,368

PHOTOINDUCED MIGRATION OF SILVER INTO CHALCOGENIDE LAYER

Adam Heller, Bridgewater; King L. Tai, Berkeley Heights, and Richard G. Vadimsky, Somerville, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 4, 1979, Ser. No. 35,803

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—323 **26 Claims**

1. Process for fabrication of an article comprising an opera-

tion during which the article undergoing fabrication comprises an article surface and an overlying actinic processing layer, said processing layer consisting essentially of a chalcogenide glass and silver-containing material, the silver-containing material being largely concentrated to essentially uniform depth in the vicinity of a surface of the said layer, including the steps of (1) selectively exposing portions of the said processing layer to actinic radiation so as to induce migration of silver in a direction from the said surface into the body of said layer within such exposed portions thereby defining a pattern of material of reduced solubility in a developing agent; (2) stripping so as to remove silver-containing material unaffected by radiation; (3) treating the said processing layer with said developing agent to selectively remove material within unexposed portions to produce a now patterned processing layer, characterized in that silver-containing material consists essentially of at least one chemical compound consisting of the reaction product of combined silver and at least one component of the glassy material, and in that stripping comprises reaction resulting in a water-soluble silver compound which reaction may be regarded as comprising conversion of silver halide to said water-soluble silver compound.

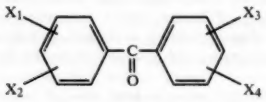
4,276,369

PHOTO—IMAGING A POLYMETHYL ISOPROPENYL KETONE (PMIPK) COMPOSITION

Minoru Tsuda, Isehara, and Yoichi Nakamura, Samukawa, both of Japan, assignors to Tokyo Ohka Kogyo Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 6, 1978, Ser. No. 957,836
Claims priority, application Japan, Nov. 4, 1977, 52-132234
Int. Cl.³ G03C *5/00*
U.S. Cl. 430—326 **3 Claims**

1. A process for forming an ultrafine pattern which comprises exposing a film of a mixture of polymethyl isopropenyl ketone having a molecular weight of from 10,000 to 1,000,000 and dispersity index of below 3 and a benzophenone compound of the general formula:



wherein X_1, X_2, X_3 and X_4 independently represent hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group or hydroxyl group, to irradiation with ultraviolet rays having a wave length in the range of from 1,000 to 3,500 Å through a mask pattern and subjecting the resulting film to a solvent removal process whereby said film is subjected to a suitable solvent which dissolves said film which has been exposed to said ultraviolet rays.

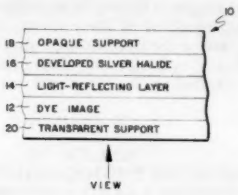
4,276,370

PHOTOGRAPHIC PROCESSING COMPOSITION CONTAINING POLYMERICS OXIME

Lloyd D. Taylor, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 894,545, Apr. 7, 1978, Pat. No. 4,202,694, which is a continuation-in-part of Ser. No. 789,422, Apr. 21, 1977, abandoned. This application Nov. 5, 1979, Ser. No. 91,066
Int. Cl.³ G03C *5/30;* **C08F** *20/34, 20/68, 22/32*
U.S. Cl. 430—466 **26 Claims**

14. A viscous photographic processing composition comprising an aqueous medium; an alkaline material; a viscosity-increasing amount of a polymeric oxime containing pendant oxime groups and having a pKa of at least 12; and a titanium



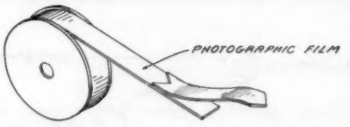
dioxide pigment; said photographic processing composition having a pH of at least 12.

4,276,371

ROLL FASTENER FOR PHOTOGRAPHIC FILM

Peter R. Scott, 156 Grant Ave., Newton, Mass. 02159

Filed Apr. 26, 1976, Ser. No. 680,123
Int. Cl.³ G03C *3/02*
U.S. Cl. 430—501 **2 Claims**



1. In a roll of photographic film which comprises a photographic emulsion coated onto a plastic film backing having means for securing the free end of the roll against unwinding; the improvement wherein said securing means comprises a strip of flexible plastic which clings to said photographic film and which is applied both to said free end and to the body of said roll adjacent said free end, said strip being free of adhesive coating.

4,276,372

PHOTOGRAPHIC MATERIAL WITH INTERIMAGE EFFECT

Ubbo Wernicke, Odenthal; Reinhart Matejec, and Franz Moll, both of Leverkusen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 898,626, Apr. 21, 1978, abandoned. This application Feb. 11, 1980, Ser. No. 120,332
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1977, 2718437
Int. Cl.³ G03C *1/76*
U.S. Cl. 430—505 **14 Claims**

1. Photographic recording material consisting of a layer substrate and at least two silver halide emulsion layers which are sensitive to different regions of the visible spectrum, at least one of which layers contains a silver halide emulsion, hereinafter referred to as type I silver halide emulsion, which releases a development inhibitor on development of the photographic material, and at least one of which layers contains a silver halide emulsion, hereinafter referred to as type II silver halide emulsion, which is capable of being inhibited by the aforesaid inhibitor,

wherein the emulsion grains of the type II silver halide emulsion are more easily soluble than the emulsion grains of the type I emulsion and

the type II emulsion is not ripened to full sensitivity whereby after its application to a layer substrate and 6 minutes' development at 30° C. in an aqueous developer containing, per liter, 2 g of ethylene diaminotetracetic acid, 0.3 g of 1-phenyl-3-pyrazolidone, 50 g of sodium sulphite, 6 g of

hydroquinone, 35 g of sodium carbonate, 215 g of potassium thiocyanate, 2 g of potassium bromide and 0.015 g of potassium iodide, it has a degree of fogging of at the most 25%, the degree of fogging being defined by the quantity of silver, calculated as silver nitrate, and multiplied by 100, situated on the layer substrate after development and fixing divided by the quantity of silver, calculated as silver nitrate, situated on the layer substrate before development.

4,276,373

PHOTOSENSITIVE PHOTOGRAPHIC MATERIAL CONTAINING A LIGHT-ABSORBING DYE

Hans Öhlschläger, Bergisch-Gladbach; Lothar Rosenhahn, Cologne, and Wolfgang Sauerteig, Leverkusen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

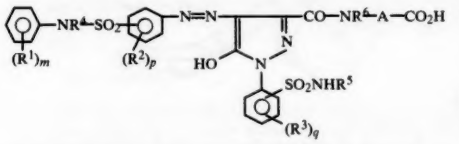
Filed Mar. 19, 1980, Ser. No. 131,808

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1979, 2911695

Int. Cl.³ G03C *1/84*

U.S. Cl. 430—507 **8 Claims**

1. A photosensitive photographic recording material comprising at least one silver halide emulsion layer and an azo dye, wherein the azo dye corresponds to the following formula:



in which

R^1, R^2, R^3 which may be the same or different represent hydrogen; alkyl which may be substituted; aryl which may be substituted; alkoxy; halogen; carbamoyl or sulphamoyl which may be substituted; cyano or an amino group which may be substituted;

R^4, R^5, R^6 which may be the same or different, represent hydrogen or alkyl which may be substituted,

A represents a difunctional hydrocarbonchain,

m is an integer of from 1 to 5,

p and q are the same or different and represent an integer of from 1 to 4.

4,276,374

SILVER HALIDE PHOTOGRAPHIC EMULSION WITH THIOETHER SENSITIZER

Hiroyuki Mifune; Nobuaki Miyasaka, and Yoshiharu Fuseya, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

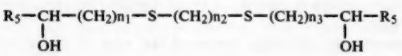
Filed May 30, 1979, Ser. No. 43,962

Claims priority, application Japan, May 30, 1978, 53-64577

Int. Cl.³ G03C *1/34*

U.S. Cl. 430—611 **11 Claims**

1. A silver halide photographic emulsion containing about 0.001 to 1 gram per mol of silver halide of the compound represented by the formula:



wherein R_5 represents an alkyl group containing 1 to 3 carbon atoms substituted by —OH, —COOH, —COOM, or —COOR, the number of substituents being 1 or 2, n_1 and n_3 each represents 1 or 2, and n_2 represents 1, 2, 3, or 4, M represents an alkali metal atom, and R represents a hydrogen atom or an alkyl group containing 1 to 5 carbon atoms.

4,276,375

DETERMINATION OF SERINE PROTEASES

Karl G. Claeson; Leif E. Aurell, both of Saro, and Leif R. Simonsson, Hisings-Backa, all of Sweden, assignors to AB Kabi, Stockholm, Sweden

Division of Ser. No. 852,006, Nov. 16, 1977, Pat. No. 4,207,232. This application Oct. 22, 1979, Ser. No. 86,970

Claims priority, application Sweden, Dec. 12, 1976, 7613463

Int. Cl.³ C12Q *1/56, 1/38*

U.S. Cl. 435—13 **15 Claims**

1. A method for diagnostic determination of serine proteases which comprises contacting a substance in which said determination of serine poteases is desired with a chromogenic or fluorogenic enzyme substrate containing the sequence -Ile-A-Gly-Arg-R_2 where A is Asp or Glu, substituted in the carboxylic group by esterification or amidation, wherein the esters contain a short chain alkyl or hydroxyalkyl or alkyl-substituted aminoalkyl or cycloalkyl group containing a total of 2–6 carbon atoms, and the amides contain mono or di-substituted short chain alkyl or hydroxyalkyl or alkyl-substituted aminoalkyl group containing a total of 1–6 carbon atoms or a heterocyclic group in which the amido nitrogen forms part of a piperidine, a morpholine or a piperazine ring, and R_2 is a group which gives a chromophore or fluorescent compound upon enzymatic hydrolysis, and then spectrophotometrically measuring the quantity of chromophore or fluorescent compound released from said substrate by enzymatic hydrolysis of the substrate by serine proteases in said substance.

4,276,376

CREATINE KINASE CONTROL SERUM

Dieter Hundt, Percha; Marianne Sedelmeyer, Weilheim; Peter Röschlau, Seeshaupt; Fritz Stähler, Tutzing, and Wolfgang Gruber, Tutzing-Unterzeismering, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jul. 16, 1979, Ser. No. 58,056

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1978, 2831390

Int. Cl.³ C12Q *1/50*

U.S. Cl. 435—17 **9 Claims**

1. Control serum comprising a base serum selected from the group consisting of human serum, animal serum or serum albumin and also containing a defined activity of creatine kinase, exogeneous to said base serum, in the form of swine serum.

4,276,377

CREATININE IMINOHYDROLASE FREE FROM UREASE ACTIVITY

Charles T. Goodhue, Rochester; Theodore W. Esders, and Prakash S. Masurekar, both of Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 5, 1979, Ser. No. 91,218

Int. Cl.³ C12Q *1/34;* C12N *9/78*

U.S. Cl. 435—18 **38 Claims**

1. A urease-free creatinine iminohydrolase enzyme preparation derived from an aerobic soil microorganism.

4,276,378

HIGH SENSITIVITY ASSAYS FOR ANGIOTENSIN CONVERTING ENZYME

James W. Ryan, 3420 Poinciana Ave., Miami, Fla. 33133, and Alfred Chung, 8781 SW. 87th St., Miami, Fla. 33173

Filed Nov. 25, 1977, Ser. No. 854,538

Int. Cl.³ C12Q *1/38, 1/36*

U.S. Cl. 435—23 **17 Claims**

1. A method for measuring the activity of angiotensin converting enzyme in a sample of clinical material, comprising:

diluting said sample in a buffer comprising a stimulatory amount of sulfate ion, where said sulfate ion is in the

concentration range of 0.1 M–1.1 M and stimulates the angiotensin converting enzyme hydrolysis of HipHisLeu;

adding sufficient HipHisLeu to the buffer-diluted sample to provide a reaction mixture having a concentration of HipHisLeu prior to incubation in the range of 1×10^{-10} M–2×10^{-3} M;

incubating the reaction mixture for a time sufficient to permit a measurable reaction to occur; and,

measuring the amount of HisLeu produced by angiotensin converting enzyme catalyzed hydrolysis of HipHisLeu.

4,276,379

PREPARATION OF HIGH FRUCTOSE SYRUPS FROM SUCROSE

Robert E. Heady, Argo, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Continuation-in-part of Ser. No. 807,289, Jun. 16, 1977, abandoned. This application Jun. 9, 1978, Ser. No. 913,278

Int. Cl.³ C12P *19/24, 19/18, 19/04;* **C12N** *9/10*

U.S. Cl. 435—94 **7 Claims**

1. A process for the production of a product containing greater than 55% fructose consisting essentially of subjecting sucrose to the action of a cell-free fructosyl transferase enzyme derived from *Pullularia pullulans* capable of converting the sucrose to a mixture comprising glucose, fructose, and polysaccharides containing at least 66% by weight of fructosyl moieties wherein the fructosyl moieties are linked by (2-1)-beta linkages, subjecting the mixture to the action of a glucose isomerase enzyme, and hydrolyzing the polysaccharides in the mixture in the absence of active isomerase enzyme.

7. A process for producing a novel substrate, suitable for production of a syrup containing greater than 55% fructose, which comprises subjecting an aqueous solution of sucrose at a concentration of at least about 10 grams sucrose per 100 ml of water to the action of an enzyme preparation consisting essentially of fructosyl transferase enzyme derived from *Pullularia pullulans* ATCC 9348 at a temperature of from about 25° C. to about 65° C. and at a pH of from about 4.5 to about 6.5 for a sufficient time to give a product wherein at least 60% by mole ratio of the polysaccharides are oligomers having from 3 to 6 monosaccharide moieties, and then inactivating the enzyme.

4,276,380

PRODUCTION OF L-AMINO ACIDS

Hideaki Yukawa; Kazuoki Osumi; Terukazu Nara, and Yoshihiro Takayama, all of Ami, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Feb. 13, 1980, Ser. No. 120,963

Claims priority, application Japan, Feb. 13, 1979, 54-15341; May 18, 1979, 54-61109

Int. Cl.³ C12P *13/08*

U.S. Cl. 435—115 **3 Claims**

1. A process for producing L-valine which comprises aerobically culturing a bacterium of the strain *Acinetobacter calcoaceticum* YK-1011, which utilizes ethanol and has an ability to produce and accumulate L-valine, in a culture medium in which ethanol is the main carbon source to produce and accumulate L-valine and collecting the L-valine.

4,276,381

PREPARATION OF IMMOBILIZED ENZYMES OF MICROORGANISMS

Akihiro Sakimae, Otake, and Hisao Onishi, Hiroshima, both of Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed Jul. 26, 1979, Ser. No. 60,907

Claims priority, application Japan, Apr. 9, 1979, 54/42725

Int. Cl.³ C12N *11/12, 11/04*

U.S. Cl. 435—179 **8 Claims**

1. A process for preparing immobilized enzymes or microorganisms, which comprises dispersing lumps of ice containing an enzyme or a microorganism in an organic solvent having a water-insoluble high-molecular weight substance dissolved therein, at a temperature not higher than 0° C. wherein the organic solvent dissolves at least 0.1% by weight of the water-insoluble high-molecular weight substance at a temperature of 0° C. or lower, and the removing the organic solvent thereby entrapping the ice lumps in the water-insoluble high-molecular weight substance.

4,276,382

ANTIBIOTIC SUBSTANCES

Francesco Parenti; Carolina Coronelli; Giorgio Tamoni, all of Milan, and Giancarlo Lancini, Pavia, all of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Division of Ser. No. 596,702, Jul. 17, 1975, Pat. No. 4,022,884. This application Aug. 30, 1976, Ser. No. 718,727

Int. Cl.³ C12N *1/20;* **C12P** *21/00;* **C12R** *1/045*

U.S. Cl. 435—253 **2 Claims**

1. A biologically pure culture of the microorganism strain *Actinoplanes garbadinensis* ATCC 31049, said culture being capable of producing Gardimycin antibiotic in a recoverable quantity upon aerobic fermentation in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic salts.

4,276,383

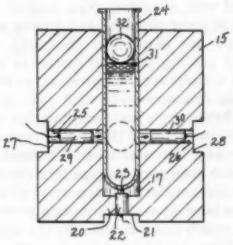
CLOT LYSING TIMER

Stephen B. Leighton, Maplewood, N.J.; Genesio Murano, Bethesda, Md.; Allen Markowitz, and Burt Chikadel, both of Gaithersburg, Md., assignors to The United States of America as represented by the Department of Health, Education & Welfare, Washington, D.C.

Filed Aug. 2, 1979, Ser. No. 63,261

Int. Cl.³ C12M *1/34*

U.S. Cl. 435—291 **14 Claims**

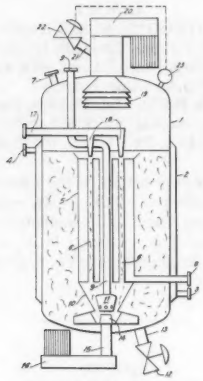


1. A clot lysing timing apparatus comprising a heating block assembly formed with a heat transfer well having a closed bottom and adapted to receive and support in a stationary upright position at least one test tube containing a clot and a lysing agent, an opaque weight member adapted to be placed on the clot and to descend therethrough to the lower part of the test tube when the clot dissolves, an electric timer, a start control switch operatively connected to said timer, means mounting said switch in a position in said well to be actuated by a test tube inserted in said well and start said timer, photo-sensitive enabling means coupled to said timer and located in said heating block assembly at one side of said well, and a light source in said heating block assembly at the opposite side of said well and providing a beam traversing said well and normally illuminating said photo-sensitive means so as to enable said timer, operation of said timer commencing in response to actuation of said switch by a test tube and terminating when said opaque weight member descends in the test tube sufficiently to interrupt said beam.

4,276,384
FERMENTER

Felix Mueller, Staefa, Switzerland, assignor to Chemap A.G., Männedorf, Switzerland

Filed Jul. 17, 1979, Ser. No. 58,325
Claims priority, application Switzerland, Jul. 19, 1978, 7774/78
Int. Cl.³ C12M 1/12
U.S. Cl. 435—311 12 Claims



1. An improved fermenter for cultivating of microorganisms in a substrate of the type in which a container bounds an inner chamber in which microorganisms are accommodated and cultivated, said improvement comprising substrate inlet means, discharge means and product collecting means for the container, a double circumferential wall for the container having inlet and outlet conduits for supplying and withdrawing of heating or cooling medium through the interior of said double circumferential wall; a guiding pipe located centrally of said container in said inner chamber and having a conical bottom portion; at least one diaphragm filter unit arranged in the interior of said guiding pipe and operative for continuously separating and withdrawing the products of metabolism of the microorganisms, simultaneously with cultivating of the latter directly in the fermenter; a main aerating pipe running from the top of said container through the central region of said guiding pipe and extending into said conical bottom portion of said guiding pipe, said main aerating pipe terminating in a distributing member in said conical bottom portion of said guiding pipe; a rotary turbine beneath said distributing member; and driving means for said rotary turbine, whereby the aspirating action of said rotary turbine provides a moderate pressure overcoming the pressure in the interior of the fermenter and whereby air is entrained by the substrate solution in the process of downward movement and whereby air bubbles of said entrained air are comminuted by said rotary turbine, thereby ensuring sufficient air supply for the microorganisms.

4,276,385
PROCESS FOR PREPARING COLD-CURED MOLDED POLYURETHANE FLEXIBLE FROM A HIGH MOLECULAR WEIGHT SILOXANE AND A SOLVENT

Rudolf J. Tenhagen, Longirod, Switzerland, assignor to BP Chemicals Limited, London, England

Filed Apr. 18, 1980, Ser. No. 141,559
Claims priority, application United Kingdom, Apr. 28, 1979, 14847/79
Int. Cl.³ C08G 18/14
U.S. Cl. 521—112 16 Claims

1. A process for the production of a cold-cured molded polyurethane flexible foam by reaction of a polyol with a polyisocyanate and foaming in the presence of a blowing agent followed by crushing of the molded foam to open the foam cells characterized in that foaming takes place in the presence of a mixture of (1) a predominantly linear siloxane polyoxyalkylene block copolymer having an average molecular weight in the range of about 20,000 to 250,000 and of formula $(AB)_n$, wherein n is an integer, A is a siloxane block and B is a polyoxyalkylene block and (2) a solvent which is compatible with the high molecular weight predominantly linear siloxane polyoxyalkylene block copolymer which has a viscosity of 3 to 1,000 cps, and a surface tension between 15 and 60 dynes/cm.

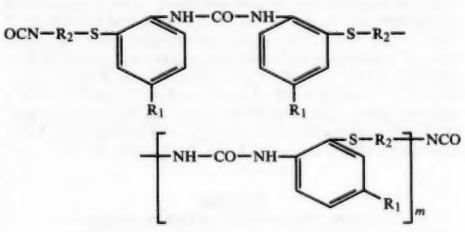
4,276,386
DIISOCYANATES HAVING UREA GROUPS, A PROCESS FOR THEIR PREPARATION AND THEIR USE IN THE PRODUCTION OF POLYURETHANES

Jürgen Schwindt, and Gerhard Grögler, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 22, 1980, Ser. No. 152,285
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1979, 2922966
Int. Cl.³ C08G 18/77, 18/14
U.S. Cl. 521—160 17 Claims

4. A mixture which is liquid at room temperature or can be liquefied by heating to a temperature of not more than 80° C. comprising:

(A) 5 to 50% by weight based on the mixture of a diisocyanate containing urea groups, which is liquid at room temperature or can be liquefied by heating to a temperature of not more than 80° C., corresponding to the formula:



wherein

m represents a number of from 0 to 3 which may be whole or fractional (on statistical average),

R_1 represents hydrogen, an alkyl group having from 1 to 4 carbon atoms or an alkylthio group having from 1 to 4 carbon atoms, and

R_2 represents a phenylene group, optionally substituted by alkyl groups having from 1 to 4 carbon atoms or by an alkylthio group having from 1 to 4 carbon atoms, or represents a linear or branched chain aliphatic hydrocarbon group having from 2 to 12 carbon atoms, with at least 2 carbon atoms being situated between the nitrogen atoms and the sulfur atom; and

(B) an isocyanate prepolymer, which is liquid at room temperature or which can be liquefied by heating to a temperature of not more than 80° C., corresponding to the formula:

wherein

n has the value of a whole or fractional number, on statistical average, of from 2 to 4,

A represents a residue as is obtained by the removal of the isocyanate groups from an organic diisocyanate, and

D represents a residue of the type obtained by the removal of the hydroxyl groups from an n-functional polyhydroxyl compound within the molecular weight range of

from 500 to 8,000 or by removal of the hydroxyl groups from a mixture of such polyhydroxyl compounds.

17. A process for the preparation of polyurethanes comprising reacting a compound containing isocyanate-reactive hydrogen atoms with a mixture as claimed in claim **4**.

4,276,387

UREAS CONTAINING THE 2,2,2-TRICHLOROETHYL GROUP AS FLAME RETARDANTS FOR POLYURETHANE FOAMS

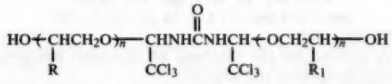
Jeffrey D. Miano, Havertown, and Stanley R. Sandler, Springfield, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 28, 1980, Ser. No. 144,751

Int. Cl.[3] **C08G** *18/14, 18/32, 18/50;* **C07C** *127/15*

U.S. Cl. 521—167 **9 Claims**

1. A compound having the formula:



wherein R and R_1 are independently selected from the group consisting of hydrogen, $—CCl_3$, $—CH_3$ and $—CH_2CCl_3$ and n is an integer of 1 to 100.

6. Polyurethane foam prepared from a reaction mixture which comprises a flame retardant amount of the compound of claim **1**.

4,276,388

MOLDING RESIN COMPOSITION

Etsuji Iwami, and Takayuki Saito, both of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Jun. 21, 1979, Ser. No. 50,520

Claims priority, application Japan, Jun. 23, 1978, 53/76012

Int. Cl.[3] **C08L** *67/06*

U.S. Cl. 525—48 **10 Claims**

1. A molding resin composition comprising:

(a) 40 to 70 parts by weight of an unsaturated polyester of at least one α,β-ethylenically unsaturated dicarboxylic acid or a mixture of said dicarboxylic acid with at least one saturated dicarboxylic acid, with a polyhydric alcohol,

(b) 60 to 20 parts by weight of a dialkyl ester of alkenyl succinic acid, and

(c) 0 to 30 parts by weight of a ethylenically unsaturated monomer.

4,276,389

GRAFT POLYMERS CONTAINING SILICON

Wolfgang Wieder, Leverkusen; Josef Witte; Hans-Heinrich Moretto, both of Cologne, and Helmut Steinberger, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 19, 1979, Ser. No. 105,224

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1978, 2856836

Int. Cl.[3] **C08G** *77/42*

U.S. Cl. 525—61 **10 Claims**

1. A graft polymer having a silicon content of from 0.1 to 20% by weight which consists of

(a) a graft basis of a homopolymer or copolymers incorporating vinyl ester and/or vinyl alcohol units; and

(b) grafted units having the formula (I)

(I)

wherein R and R′ are the same or different and each is a substituted or unsubstituted aliphatic, cycloaliphatic or aromatic group having from 1 to 20 carbon atoms.

8. A process for the preparation of a graft polymer as claimed in claim **1** which comprises:

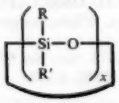
(i) reacting an optionally partially or completely saponified homopolymer or copolymer of a vinyl ester of an aliphatic C_1–C_{18} monocarboxylic acid in solvent-free condition or in an organic solvent at a temperature of from 20° to 200° C. with 0.01 to 5% by weight, based on the polymer, of an inorganic or organic base corresponding to formulae II, III, IV, or mixtures thereof

$$Me(OR'')_n \quad \text{(II)};$$

$$Me(R'')_n \quad \text{(III)};$$

$$Me(NR''_2)_n \quad \text{(IV)}$$

wherein Me is an element of the first or second main group of the periodic system, n is 1 or 2 and R″ is a hydrogen atom or an aliphatic, cycloaliphatic or aromatic group having from 1 to 20 carbon atoms; and (ii) reacting the product of step (i) with one or more cyclic siloxanes of formula (V),



(V)

wherein R and R′ are as defined in claim **1** and x is an integer of from 3 to 10.

4,276,390

FLAME-SPRAYING COATING

Masamitsu Nakabayashi; Fumihiro Doura, both of Osaka, and Teruo Hori, Ibaraki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Doshomachi, Japan

Filed Feb. 8, 1980, Ser. No. 119,779

Claims priority, application Japan, Feb. 9, 1979, 54/14869

Int. Cl.[3] **C08G** *18/62, 18/80;* **B05D** *1/08*

U.S. Cl. 525—61 **7 Claims**

1. A powdered composition for flame-spraying coating, which comprises (1) an organic polyisocyanate blocked with ethyleneimine and (2) a partially hydrolyzed product of an ethylene-vinyl ester copolymer and/or a carboxyl modified product of said hydrolyzed product the proportions of said components being 0.01 to 1 mole of the isocyanate group of component (1) to each 1.0 mole of the hydroxyl group contained in component (2).

4,276,391

HIGH-IMPACT THERMOPLASTIC VINYL CHLORIDE POLYMER MOULDING COMPOSITION

Dietrich Hardt, Cologne; Gert Humme, Odenthal; Karl-Heinz Ott, Leverkusen, and Hans-Eberhard Braese, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 887,735, Mar. 17, 1978, abandoned, which is a continuation of Ser. No. 707,548, Jul. 22, 1976, abandoned. This application Dec. 17, 1979, Ser. No. 104,183

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1975, 2534013

Int. Cl.[3] C08L *51/04, 57/08*

U.S. Cl. 525—71 5 Claims

1. A thermoplastic moulding composition comprising

(a) 75 to 99 parts by weight of a graft polymer of 90 to 99% of vinyl chloride onto 1 to 10% by weight of an ethylene vinyl ester copolymer, and

(c) 1 to 25 parts by weight of a graft polymer consisting essentially of ethylene propylene terpolymer rubber onto which is grafted a member selected from the group consisting of styrene, methylmethacrylate, a mixture of styrene and methlymethacrylate, and a mixture of styrene and acrylonitrile.

4,276,392

COATING COMPOSITION CATALYZED WITH PHOSPHONIC ACID DERIVATIVE - #3

Mohinder S. Chattha, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 13, 1979, Ser. No. 93,715

Int. Cl.[3] C08L *63/00*

U.S. Cl. 525—118 12 Claims

1. A thermosetting coating composition adapted for low temperature bake applications which, exclusive of pigments, solvents and other nonreactive components, consists essentially of:

(A) a polyepoxide resin having a number average molecular weight ($\overline{M}_n$) of between about 140 and about 3,000;

(B) a reactive catalyst comprising at least one phosphonic acid derivative having the formula:

$$R[\overset{\overset{O}{\|}}{P}(OH)_2]_n$$

wherein n=1 to 2 and R is selected from the group consisting of alkyl, cycloalkyl and aryl radicals;

(C) an amino resin crosslinking agent; and

(D) up to about 45 weight percent based on the total weight of (A), (B), (C) and (D) of a hydroxy functional additive having a number average molecular weight (M_n) of between about 150 and about 6000, said phosphonic acid derivative being included in said composition in an amount sufficient to provide between about 0.8 and about 1.4 equivalents of acid functionality for each equivalent of epoxy functionality on said polyepoxide resin, and said amino resin crosslinking agent being included in said composition in an amount sufficient to provide at least about 0.4 equivalents of nitrogen crosslinking functionality for each equivalent of hydroxy functionality included in said composition as a group on an initial component thereof or generated in situ as a result of esterification of said pendent epoxy functionality of said copolymer during cure of said coating composition.

4,276,393

CHAR-FORMING ADDITIVES FOR OLEFIN POLYMERS

John C. Falk, Chicago, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 10, 1979, Ser. No. 101,607

Int. Cl.[3] C08L *9/02, 47/00*

U.S. Cl. 525—233 4 Claims

2. A composition comprising 100 parts by weight of an olefin polymer selected from the group consisting of styrene polymers and polypropylene, and from 5 to about 30 parts by weight of a polymer of butadiene having greater than 80% of the ethylenic unsaturation converted to cyclopropane units.

4,276,394

NOVEL TELECHELIC POLYMERS, BLOCK COPOLYMERS AND PROCESSES FOR THE PREPARATION THEREOF

Joseph P. Kennedy; Robert A. Smith, and Louis R. Ross, Jr., all of Akron, Ohio, assignors to The University of Akron, Akron, Ohio

Filed Sep. 10, 1979, Ser. No. 73,790

Int. Cl.[3] C08F *4/14, 4/16, 10/10, 293/00*

U.S. Cl. 525—245 25 Claims

1. A process for the synthesis of telechelic halogenated polymers comprising the steps of:

charging a cationically polymerizable olefin monomer having from about 4 to about 12 carbon atoms per molecule and an inifer to a suitable reaction vessel, said inifer charged in a concentration from about 10^{-4} to about 10^{-1} moles per mole of said polymerizable olefin monomer;

adding a solution of a fully chlorinated metal chloride Friedel-Crafts acid coinitiator in a solvent; and,

polymerizing said olefin monomer to form said telechelic halogenated polymer;

said inifer selected from the group consisting of AYn, BZ, and oligomers of α-chlorostyrene having from 2 to 6 units;

where A is selected from the group consisting of condensed and noncondensed aromatic compounds having from 1 to 4 rings, and linear and branched aliphatic compounds having from 3 to 20 carbon atoms;

where Y is represented by the formula:

$$\begin{array}{c} R \\ | \\ C-X \\ | \\ R' \end{array}$$

where R and R′ are selected from the group consisting of hydrogen, methyl, and phenyl, and R and R′ can be the same when A is an aromatic compound, or where R is phenyl when A is an aliphatic compound;

where X is a halogen selected from the group consisting of fluorine, chlorine, and bromine, and where n is an integer from 2 to 6; and where B is selected from hydrocarbons having from 8 to 20 carbon atoms, and where Z is a tertiary halogen selected from the group consisting of tertiary fluorine, tertiary chlorine, or tertiary bromine.

2. A process for the synthesis of a thermoplastic block copolymer comprising the steps of:

charging a cationically polymerizable olefin monomer having from about 4 to about 12 carbon atoms per molecule and an inifer to a suitable reaction vessel said inifer charged in a concentration from about 10^{-4} to about 10^{-1} moles per mole of said polymerizable olefin monomer;

adding a solution of a Freidel-Crafts acid coninitiator in a solvent;

polymerizing said olefin monomer to form a telechelic halogentated polymer;

thereafter dissolving said telechelic polymer in said solvent;

adding a vinyl aromatic monomer having from 8 to about 20

carbon atoms with mixing and addition of said solvent to form a homogeneous medium;

adding a Friedel-Crafts acid coinitiator in said solvent to induce block polymerization of said vinyl aromatic monomer from said telechelic halogenated polymer to form said block copolymer;

said inifer selected from the group consisting of AY_n, BZ, and oligomers of α-chlorostyrene having from 2 to 6 units;

where A is selected from the group consisting of condensed and noncondensed aromatic compounds having from 1 to 4 rings, linear and branched aliphatic compounds having from 3 to 20 carbon atoms;

where Y is represented by the formula:

where R and R′ are selected from the group consisting of hydrogen, methyl, and phenyl, and R and R′ can be the same when A is an aromatic compound, or where R is phenyl when A is an aliphatic compound;

where X is a halogen selected from the group consisting of fluorine, chlorine, and bromine, and where n is an integer from 2 to 6;

where B is selected from hydrocarbons having from 8 to 20 carbon atoms, and where Z is a tertiary halogen selected from the group consisting of tertiary fluorine, tertiary chlorine, or tertiary bromine.

17. A novel telechelic polymer formed from an inifer and a cationically polymerizable olefin monomer having from about 4 to about 12 carbon atoms, said polymer having a residue of said inifer in the backbone thereof and carrying at least two tertiary halogen termini;

said inifer selected from the group consisting of AY_n, and oligomers of α-chlorostyrene having from 2 to 6 units;

where A is selected from the group consisting of condensed and noncondensed aromatic compounds having from 1 to 4 rings, linear and branched aliphatic compounds having from 3 to 20 carbon atoms;

where Y is represented by the following formula:

where R and R′ are selected from the group consisting of hydrogen, methyl and phenyl, and R and R′ can be the same when A is an aromatic compound, or where R or R′ is phenyl when A is an aliphatic compound;

where x is a halogen selected from the group consisting of fluorine, chlorine, and bromine, where n is an integer from 2 to 6.

22. A novel thermoplastic elastomer block copolymer comprising:

a central elastomer moiety formed from a cationically polymerizable olefin monomer having from about 4 to about 12 carbon atoms, said elastomer moiety having at least two ends, each said end carrying;

a glassy block polymer moiety formed from a vinyl aromatic monomer having from 8 to about 20 carbon atoms.

4,276,395

NOVEL FISCHER-TROPSCH CATALYSTS

Kurt P. C. Vollhardt, Kensington, and Patrick Perkins, Berkeley, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 39,986, May 17, 1979, Pat. No. 4,230,633. This application Apr. 29, 1980, Ser. No. 145,188

Int. Cl.³ C08F *210/00, 212/00*

U.S. Cl. 525—332 **9 Claims**

1. A composition of the formula:

where:

(PS) represents a macroporous divinylbenzene crosslinked polystyrene in which the divinylbenzene crosslinking is greater than 1% and less than about 18%; and in which the pore size is in the range of about of about 100 through 900A°

R represents a cycloalkadienyl radical of 4 through 6 carbon atoms;

Me represents a Group VIII metal;

CO represents a carbonyl radical;

H represents hydrogen;

n represents an integer varying from 0 through 3.

m represents an integer varying from 0 through 2 inclusively with the further provision that 2n+m must total 18 when added to the electrons in R and Me, or n+m must total 0.

4,276,396

HYDROCARBON RESIN AND PROCESS FOR ITS PREPARATION

Donald E. Gwynn, Overton, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 24, 1980, Ser. No. 143,243

Int. Cl.³ C08F *8/04*

U.S. Cl. 525—338 **6 Claims**

1. A high softening point hydrocarbon resin prepared by a process which comprises heat treating the C_5 and higher hydrocarbon fraction mixture obtained in the steam cracking of propane and ethane, fractionating said heat treated hydrocarbon fraction to remove the olefins and aromatics up through toluene, polymerizing said fractionated heat treated fraction with a Friedel-Crafts catalyst, diluting said polymerized hydrocarbon fraction, washing said diluted polymerized hydrocarbon fraction with aqueous caustic, drying said washed fraction, and hydrogenating said dried fraction to provide a low color hydrocarbon resin having a softening point of about 115° to about 130° C. and a Gardner color of not more than 5.

4,276,397

BLEND OF POLYARYLENE SULFIDE AND WHOLLY AROMATIC POLYESTER

Michael F. Froix, Belmont, Calif., assignor to Celanese Corporation, New York, N.Y.

Filed Jul. 7, 1980, Ser. No. 166,631

Int. Cl.³ C08L *67/00*

U.S. Cl. 525—448 **59 Claims**

1. A polymer blend which is capable of exhibiting an anisotropic melt phase, improved processability characteristics, and the ability to form molded articles having satisfactory mechanical properties comprising:

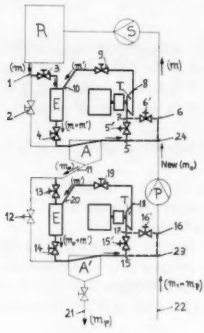
(a) approximately 5 to approximately 95 percent by weight, based upon the total weight of components (a) and (b), of a polyarylene sulfide, and

(b) approximately 5 to approximately 95 percent by weight, based upon the total weight of components (a) and (b), of a melt processable wholly aromatic polyester which is capable of forming an anisotropic melt phase apart from said blend.

4,276,398
METHOD OF RECOVERING ENERGY IN THE MANUFACTURE OF POLYMERS FROM MONOMERIC GAS AND APPARATUS FOR CARRYING OUT THE METHOD

Jacques G. Kempf, Schafmattweg 55, CH-4102 Binningen, Switzerland

Filed Sep. 18, 1979, Ser. No. 76,651
Claims priority, application Switzerland, Sep. 20, 1978, 9825/78
Int. Cl.³ C08F 2/34
U.S. Cl. 526—68 **9 Claims**



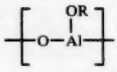
1. A method of recovering energy in the manufacture of polymers from monomeric gas, said method comprising:
(a) compressing and partially converting the monomeric gas into a polymer in a reactor by polymerization,
(b) accelerating and decompressing the polymer-gas mixture being discharged from the reactor in a nozzle system of an energy exchange unit,
(c) mixing the stream of said polymer-gas mixture in the energy exchange unit with an almost polymer-free working stream of the same gas under simultaneous compression,
(d) separating the almost polymer-free gas of the working stream from the mixture in a separator and passing it in a separate circuit after passing through the separator,
(e) conveying the working stream in the separate circuit to a decompression means and decompressing it therein by energy release,
(f) conveying the working stream after being discharged from the decompression unit into the energy exchange unit to the region of the nozzle system of the energy exchange unit, and
(g) in the region of the nozzle system conveying together the polymer-gas mixture from the reactor and the working stream from the decompression means, wherein the working gas stream is continuously re-compressed in the energy exchange unit to the pressure in the separator.

4,276,399
SUPPORTED CATALYST FROM CHROMIUM FOR OLEFIN POLYMERIZATION

Louis J. Rekers, Wyoming, and Anthony N. Speca, Cincinnati, both of Ohio, assignors to National Petro Chemicals Corp., New York, NY

Division of Ser. No. 961,574, Nov. 17, 1978, Pat. No. 4,189,402, which is a continuation of Ser. No. 800,585, May 25, 1977, abandoned. This application Mar. 30, 1979, Ser. No. 25,418
Int. Cl.³ C08F 4/24
U.S. Cl. 526—106 **6 Claims**

1. A process for the polymerization of olefins comprising reacting at least one olefin at from about 40° C. to about 200° C. and from 200 to 1000 psig in the presence of a catalytically effective amount of a heat activated catalyst comprising an inorganic support having surface hydroxyl groups, there being deposited upon the support (a) a chromium compound capable of reacting with the surface hydroxyl groups of the support and (b) a polymeric hydrocarbon aluminate essentially resistant to hydrolysis under preparative conditions for the catalyst and having at least one



unit, wherein R is a hydrocarbyl radical having up to about 10 carbon atoms.

4,276,400
OLEFIN POLYMERIZATION PROCESS USING PRETREATED CATALYST

Reeder E. Bissell, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 837,113, Sep. 28, 1977, abandoned. This application Jun. 13, 1979, Ser. No. 48,209
Int. Cl.³ C08F 4/66, 10/06
U.S. Cl. 526—152 **9 Claims**

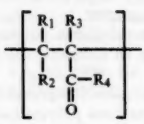
1. In a solution process for polymerizing alpha-olefins containing at least three carbon atoms and mixtures of alpha-olefins containing at least three carbon atoms with ethylene to solid, high molecular weight polymer having a crystallinity of at least 70 percent which comprises contacting said alpha-olefin, at a temperature in the range of about 140° to about 300° C. and a pressure in the range of about atmospheric to about 2,000 atmospheres, with a catalyst mixture comprising (1) an organopolylithiumaluminum compound prepared by reacting lithium alkyl with at least one aluminum compound selected from the group consisting of aluminum trialkyl and dialkyl aluminum hydride, (2) an alkyl compound selected from the group consisting of lithium alkyl, aluminum trialkyl and dialkyl aluminum hydride and (3) the alpha form of titanium trichloride wherein the ratio of lithium to aluminum in the catalyst mixture is 0.1:1 to 4:1, the ratio of aluminum to titanium in the catalyst mixture is 0.1:1 to 1:1, and the ratio of lithium to titanium is 0.1:1 to 1:1; the improvement which comprises preactivating said catalyst mixture by initially polymerizing a small amount of propylene at a temperature of 0° C. to 80° C. with said catalyst mixture under slurry polymerizing conditions prior to using said catalyst in said solution process and thereafter adding said preactivated catalyst to a solution process being operated at a temperature of at least 140° C.

4,276,401
N-HETEROCYCLIC SUBSTITUTED ACRYLOYL POLYMERIC COMPOUNDS

Friedrich Karrer, Zofingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

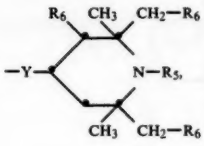
Filed Oct. 5, 1979, Ser. No. 82,392
Claims priority, application Switzerland, Oct. 13, 1978, 10647/78
Int. Cl.³ C08F 220/34, 220/54, 220/60
U.S. Cl. 526—263 **11 Claims**

1. A copolymeric compound useful as a light stabilizer and UV absorber in organic materials which carries side N-heterocyclic rings and contains the recurring structural unit of the formula (I)

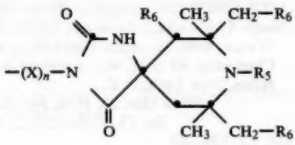


(I)

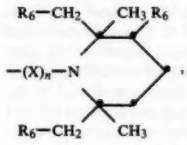
in which R_1 and R_2 are hydrogen and R_3 is hydrogen or C_1–C_4 alkyl and R_4 is a N-heterocyclic substituent of the formulae (II), (III), (IV) or (V)



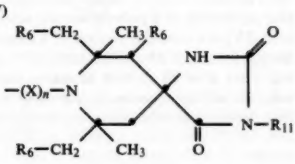
(II)



(III)



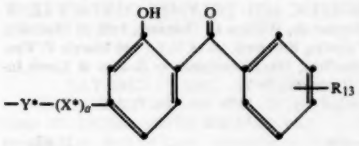
(IV)



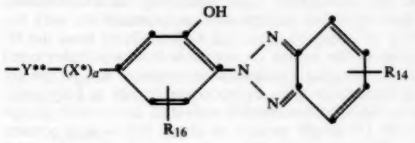
(V)

in which R_5 is hydrogen, oxyl, C_1–C_{18} alkyl, C_3–C_8 alkenyl, C_3–C_6 alkynyl, C_7–C_{12} aralkyl, C_2–C_{21} alkoxyalkyl, cyanomethyl, an aliphatic acyl group having 1 to 4 carbon atoms or a group $—CH_2COOR_7$, in which R_7 is C_1–C_{12} alkyl, C_3–C_8 alkenyl, phenyl, C_7–C_8 aralkyl or cyclohexyl, and R_6 is hydrogen or methyl and Y is —O— or

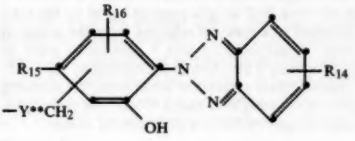
in which R_9 is hydrogen, C_1–C_{12} alkyl, C_5–C_8 cycloalkyl or C_7–C_{12} aralkyl, and X is a group of the formula $—O—CH(R_{10})—CH_2—$ (VI), in which R_{10} is hydrogen, methyl, ethyl, phenoxymethyl or phenyl, and n is 0 or 1, and R_{11} is C_1–C_{18} allyl, cyclohexyl, phenyl, benzyl or a group of the formula $—CH_2—COOR_{12}$ (VII), in which R_{12} is C_1–C_8 alkyl, and, furthermore, R_4 is one of the groups of the formulae (VIII), (IX), (X) or (XI)



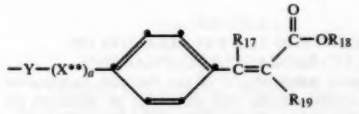
(VIII)



(IX)



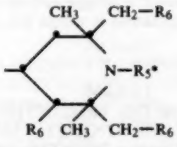
(X)



(XI)

in which Y and Y** have the meaning defined above for Y, and Y* is —O— or

in which R_9* is hydrogen or C_1–C_8 alkyl, and X is a group of the formula $—CH(R_{10})—(CH_2)_b—O—$ (XII), in which b is 1 or 2 and R_{10} is as defined above, and a is 0 or 1, and R_{13} is hydrogen, methyl or chlorine and R_{14} is hydrogen, methyl, methoxy or chlorine and R_{15} is hydrogen or hydroxyl and R_{16} is H, C_1–C_{12} alkyl, C_5–C_8 cycloalkyl, phenyl, C_7–C_{12} aralkyl or chlorine and X* is a group of the formula (XII), in which R_{10} is as defined above and b is 1, and R_{17} is hydrogen or C_1–C_4 alkyl and R_{18} is C_1–C_{12} alkyl, C_5–C_8 cycloalkyl or a group of the formula (XIII)



(XIII)

in which R_5* is hydrogen, C_1–C_8 alkyl, C_3–C_8 alkenyl, C_7–C_{12} aralkyl or an aliphatic acyl group having 1 to 4 carbon atoms and R_6 is as defined above, and R_{19} is —CN or a group of the formula $—COOR_{18}$ (XV), in which R_{18} is as defined above, with the proviso that, in the copolymeric molecule containing the recurring structural unit I, at least one (A) of the substituents R_4 is one of the groups of the formula (II), (III), (IV) or (V) and at least one (B) of the substituents R_4 is one of the groups of the formulae (VIII), (IX), (X) or (XI), (A):(B) being in a ratio of 50:1 to 1:50.

1007 O.G.—78

4,276,402

POLYSILOXANE/ACRYLIC ACID/POLCYCLIC ESTERS OF METHACRYLIC ACID POLYMER CONTACT LENS

Richard C. Chromecek; William G. Deichert, both of Macedon; Joseph J. Falcetta, Pittsford, all of N.Y., and Martin F. Van-Buren, Chelmsford, Mass., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Sep. 13, 1979, Ser. No. 75,365
Int. Cl.³ C08F *30/08*
U.S. Cl. 526—264 **31 Claims**

1. A soft, hydrophilic, water absorbing, flexible, fillerless, hydrolytically stable, biologically inert contact lens with the capability of transporting oxygen sufficiently to meet the requirements of the human cornea made from a polymer comprising polymerizing a polysiloxane monomer α,ω terminally bonded through divalent hydrocarbon groups to polymerizable, free radical polymerizably activated, unsaturated groups with from 1.0 weight percent to about 30.0 weight percent based on the total weight of the polymer of acrylic acid and 5.0 weight percent of about 50.0 weight percent based on the total weight of the polymer of a material selected from the group of a polycyclic ester of acrylic acid and a polycyclic ester of methacrylic acid forming a polymer in a crosslinked network, said polymer capable upon saturation with water of retaining from about 1 percent by weight to about 99 percent by weight, based on the total weight of the dry polymer, of water.

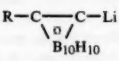
4,276,403

PROCESS FOR THE PREPARATION OF POLYCARBORANYLPHOSPHAZENES

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Harry R. Allcock, State College, Pa.; John P. O'Brien, Wilmington, Del.; Angelo G. Scopelianos, University Park, Pa., and Larry L. Fewell, San Jose, Calif.

Filed Mar. 12, 1980, Ser. No. 129,798
Int. Cl.³ C08G *73/00*
U.S. Cl. 528—4 **3 Claims**

1. A process for the preparation of carboranyl-substituted polyphosphazenes, which comprises allowing a solution of a lithiocarborane having the formula



to react at about ambient temperature with a solution of a polyphosphazene of the formula $[N=PX_2]_n$ for a period of at least 25 minutes, said reactants being present in an original concentration ranging from about equimolar to a 50% excess of either reactant, and said formulas being further defined by R being a substituent selected from the class consisting of hydrogen, alkyl radicals of up to about 6 carbon atoms, and aryl radicals of up to about 9 carbon atoms; X being fluorine, chlorine or bromine; and n being an integer such that the molecular weight of the polyphosphazene is within the range of about 10^4 to 1×10^6.

4,276,404

PROCESS FOR THE PRODUCTION OF INORGANIC-ORGANIC SYNTHETIC MATERIALS

Hans-Joachim Scholl, Cologne; Dieter Dieterich, Leverkusen, both of Fed. Rep. of Germany, and Peter Markusch, New Martinsville, W. Va., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 1, 1978, Ser. No. 930,128
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1977, 2734691
Int. Cl.³ C08G *18/22, 18/14, 18/77*
U.S. Cl. 528—57 **7 Claims**

1. A process for the production of inorganic-organic synthetic foam materials having high strength elasticity, dimensional stability under heat, and flame resistance, consisting of a polymer-polysilicic acid gel composite material in the form of a solid/solid xerosol, said process comprising mixing

(a) an organic polyisocyanate

(b) an aqueous alkali metal silicate solution and/or an aqueous silica sol having an inorganic solid content of from 20–80% by weight,

(c) a flowable solid inorganic compound and optionally

(d) catalysts and conventional polyurethane foam additives and allowing the resulting mixture to react, characterized in that mixing is carried out by first combining components (a) and (b), optionally with the addition of all or part or none of component (d), to form a stable primary dispersion and thereafter adding component (c), optionally with the addition of all or part or none of component (d), to form a final dispersion.

4,276,405

LOW-ENERGY-CURABLE COATINGS COMPOSITIONS

Joseph V. Koleske, Charleston; Oliver W. Smith; Haywood G. France, both of South Charleston, and Robert A. Taller, Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 28, 1980, Ser. No. 134,988
Int. Cl.³ C08G *59/42, 63/08*
U.S. Cl. 528—58 **24 Claims**

1. A high solids liquid coating composition comprising (I) from 5 to 60 weight percent of an epoxide, (II) an organic polyisocyanate, (III) from 4 to 60 weight percent of a liquid polycarboxylic acid and (IV) from 0.1 to 10 weight percent of a stannous salt catalyst; said percentages based on the combined weight of (I), (II), (III) and (IV); wherein said conponent (III) comprises the reaction product mixture produced by the reaction of (i) a polycaprolactone polyol and (ii) from 0.5 to 1 carboxylic acid anhydride equivalent for each hydroxyl equivalent present in said polycaprolactone polyol of an intramolecular anhydride of a polycarboxylic acid; wherein said component (IV) is a stannous acylate of a mono- or dicarboxylic acid having from 1 to 54 carbon atoms or a stannous alkoxide having from 1 to 18 carbon atoms in the alkoxide group; and wherein said component II is present in a concentration such that the epoxide/isocyanato equivalent ratio is 0.2 to 1.5.

4,276,406

CATALYST FOR REACTING PHENOLIC HYDROXYL GROUPS WITH EPOXY GROUPS

Georgia A. Monnerat; George E. Ham; Thomas J. Hairston, all of Lake Jackson, Tex., and Melvin J. Hatch, Socorro, N. Mex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 10, 1980, Ser. No. 139,071
Int. Cl.³ C08G *59/06, 59/68*
U.S. Cl. 528—92 **12 Claims**

1. A process for reacting a vicinal epoxide with an aromatic hydroxyl-containing material in the presence of a catalyst resulting from the treatment of (A) a solid substrate containing a plurality of ion-exchangeable cations treated with (B) a polymer containing a plurality of quaternary onium cations associated with a reactive anion; wherein components (A) and (B) are employed in quantities such that the resultant catalyst contains quaternary onium cation-anion sites.

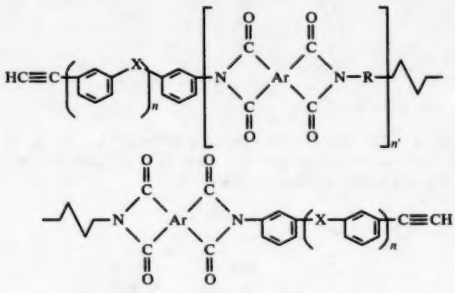
4,276,407

ACETYLENE TERMINATED IMIDE OLIGOMERS WHICH MELT AT LOW TEMPERATURES

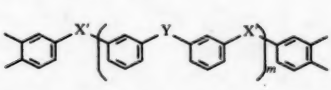
Norman Bilow, Encino, and Abraham L. Landis, Northridge, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 16, 1979, Ser. No. 66,985
Int. Cl.[3] C08G 73/10, 73/12
U.S. Cl. 528—172 12 Claims

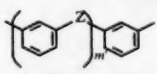
1. A phenylacetylene terminated imide oligomer having the structure



where X is O, S, CH_2, SO_2, CO, or $C(CF_3)_2$, Ar is a tetravalent organic moiety having the structure



R is a divalent organic moiety having the structure



wherein X' is O, S, $>C(CF_3)_2$, CO, or CH_2, Y is O, S, $>C(CF_3)_2$, CO, or CH_2, m is at least 1, Z is S, O, CH_2, $>C(CF_3)_2$, $>C(CH_3)_2$, CO, SO_2, C_6H_4, $—C_6H_4—Y'—C_6H_4—$, or $—Y'—C_6H_4—Y'—C_6H_4—Y'$ wherein Y' is S, O, CH_2, $>C(CF_3)_2$, $>C(CH_3)_2$, SO_2 or mixtures thereof and where n ranges from 0 to 4, n' ranges from 0 to 4, m' ranges from 0 to 2.

4,276,408

METHOD OF PRODUCING A RESIN FOR PRODUCING HEAT STABLE PRODUCTS, THE RESIN AND THE PRODUCTS

Joseph G. Robinson, Winchcombe, and Sally A. Brain, Tewkesbury, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Feb. 11, 1980, Ser. No. 120,395
Claims priority, application United Kingdom, Mar. 2, 1979, 07384/79
Int. Cl.[3] C08G 10/02, 16/02
U.S. Cl. 528—247 8 Claims

1. A method of producing a phenolated resin which is curable to give a heat stable product, comprising the steps of;(1) reacting an alkylated mononuclear aromatic hydrocarbon with formaldehyde to give a condensation resin having an oxygen content from 2 to 18%; (2) subjecting the condensation resin to a distillation process at a temperature up to 200° C. for at least five hours under reduced pressure to produce an intermediate resin containing less than 1% low molecular weight material; and (3) reacting one part of the intermediate resin with from 0.7 to 2.0 parts of phenol to produce the phenolted resin.

4,276,409

LAYERED CYANO END TERMINATED ORGANOPHOSPHORUS INORGANIC POLYMERS

Peter M. DiGiacomo, Mission Viejo, and Martin B. Dines, Santa Ana, both of Calif., assignors to Occidental Research Corporation, Irvine, Calif.

Filed Jul. 2, 1979, Ser. No. 54,107
Int. Cl.[3] C08G 67/00, 73/00, 79/04
U.S. Cl. 528—362 14 Claims

1. Inorganic phosphorus containing polymers providing pendant cyano groups, and which include units of the formula

$$M(O_3PRCN)_2$$

wherein R is an organo group and the oxygen atoms are bonded to phosphorus and structurally linked to M, which is one or more tetravalent metals selected from the group consisting of zirconium, cerium, thorium, uranium, hafnium, lead and titanium, and wherein the molar ratio of phosphorus to tetravalent metal in the inorganic phosphorus containing polymer is about 2 to 1.

4,276,410

LAYERED ORGANOPHOSPHORUS INORGANIC POLYMERS CONTAINING MERCAPTO OR THIO GROUPS

Peter M. DiGiacomo, Mission Viejo, and Martin B. Dines, Santa Ana, both of Calif., assignors to Occidental Research Corporation, Irvine, Calif.

Filed Jul. 2, 1979, Ser. No. 54,097
Int. Cl.[3] C08G 67/00, 75/00, 79/04
U.S. Cl. 528—373 12 Claims

1. Inorganic phosphorus containing polymers providing pendant mercapto or thio groups, and which contain units of the formula

$$M(O_3PRSH)_2, \text{ or } M(O_3PRSR')_2$$

wherein R and R' are organo groups and the oxygen atoms are bonded to phosphorus and structurally linked to M which is one or more tetravalent metals selected from the group consisting of zirconium, cerium, thorium, uranium, hafnium, lead and titanium, and wherein the molar ratio of phosphorus to tetravalent metal in the inorganic phosphorus containing polymer is about 2 to 1.

4,276,411

LAYERED ORGANOPHOSPHORUS INORGANIC POLYMERS CONTAINING ACYCLIC GROUPS

Peter M. DiGiacomo, Mission Viejo, and Martin B. Dines, Santa Ana, both of Calif., assignors to Occidental Research Corporation, Irvine, Calif.

Filed Jul. 24, 1979, Ser. No. 60,079
Int. Cl.[3] C08G 79/04, 79/00
U.S. Cl. 528—395 25 Claims

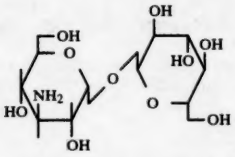
1. Solid inorganic polymers derived from acyclic organo group-containing phosphorus or phosphoric acids, wherein three oxygens bonded to phosphorus are structurally linked to one or more tetravalent metals selected from the group consisting of titanium, zirconium, cerium, hafnium, lead, thorium and uranium, and wherein the molar ratio of phosphorus to tetravalent metal is about 2 to 1.

4,276,412
3-TREHALOSAMINE COMPOUNDS

Lester A. Dolak, Plainwell; Alice L. Laborde, Kalamazoo, and Thomas M. Castle, Portage, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Sep. 17, 1979, Ser. No. 76,489
Int. Cl.[3] A61K *31/71;* C07H *5/06*
U.S. Cl. 536—17 R 14 Claims

1. Antibiotic 3-trehalosamine which can be shown by the following structural formula:

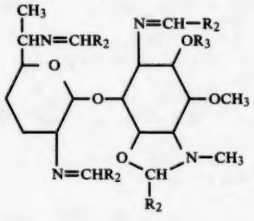


4,276,413
FORTIMICIN INTERMEDIATES FOR PRODUCING 2-DEOXYFORTIMICINS

Jerry R. Martin; John S. Tadanier, both of Waukegan, and Paulette Collum, Zion, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 863,006, Dec. 21, 1977, Pat. No. 4,192,867. This application Nov. 6, 1979, Ser. No. 91,864
Int. Cl.[3] C07H *15/20*
U.S. Cl. 536—17 R 2 Claims

1. A compound of the formula



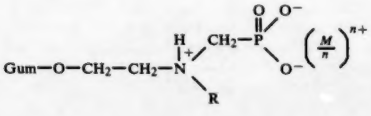
wherein R_2 are the same or different members of the group consisting of hydrogen, phenyl, hydroxy, methyl or methoxy-substituted phenyl; and R_3 is hydrogen or a C_1 to C_8 hydrocarbon sulfonic acid.

4,276,414
NOVEL ZWITTERION POLYGALACTOMANNAN ETHER DERIVATIVES AND A METHOD FOR THE PREPARATION THEREOF

Martin M. Tessler, Edison, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 107,347, Dec. 26, 1979, abandoned. This application Sep. 22, 1980, Ser. No. 189,397
Int. Cl.[3] C08B *37/00;* C07G *17/00*
U.S. Cl. 536—114 12 Claims

1. As a composition of matter, a zwitterion polygalactomannan ether derivative of the general structure



(i)

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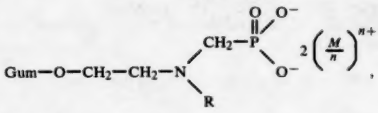
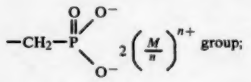


(ii)

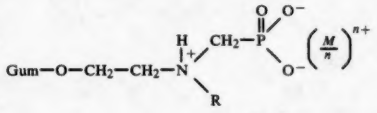
or a combination of (i) and (ii), wherein Gum-O represents a polygalactomannan gum molecule; R is a C_1–C_6 alkyl group, a C_3–C_6 cycloalkyl group or a



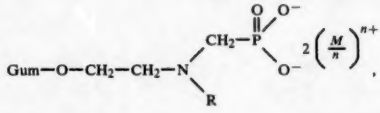
group;

M is a cation; and n is the valence number of M.

7. A method for preparing a zwitterion polygalactomman ether derivative of the general structure

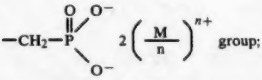


(i)



(ii)

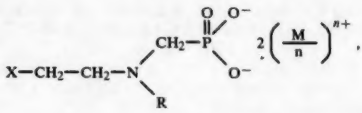
or a combination of (i) and (ii), wherein Gum-O represents a polygalactomanan gum molecule; R is a C_1–C_6 alkyl group, a C_3–C_6 cycloalkyl group or a



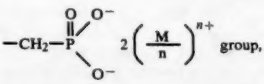
group;

M is a cation; and n is the valence number of M, which comprises the steps of:

a. reacting a polygalactomannan gum base with about 0.1 to 100% by weight, based on the dry gum, of a zwitterion reagent having the general formula



wherein X is chlorine or bromine, R is a C_1–C_6 alkyl group, a C_3–C_6 cycloalkyl group, or a



group,

M is a cation, and n is the valence number of M; and

b. isolating the resulting zwitterion polygalactomannan ether derivative.

4,276,415

BASIC DYES

Hans-Jürgen Degen, 6 Schillerstrasse, 6143 Lorsch, and Klaus Grychtol, 96A Seebacher Strasse, 6702 Bad Duerkheim 1, both of Fed. Rep. of Germany

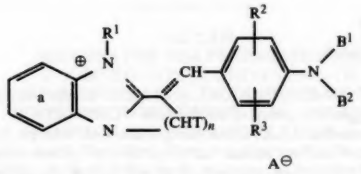
Filed Jan. 2, 1980, Ser. No. 109,045

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1979, 2902763

Int. Cl.[3] C09B 23/02; C07D 471/14, 487/04

U.S. Cl. 542—435 2 Claims

1. A basic dye of the formula I:

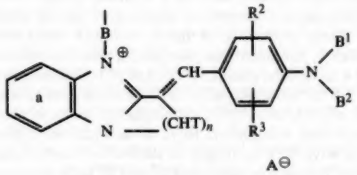


(I)

where

$A^{\ominus}$ is an anion,

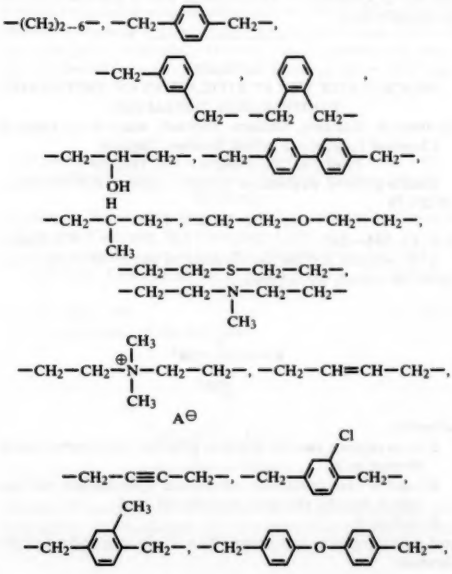
R^1 is unsubstituted or substituted alkyl or a radical of the formula II:



(II)

where

B is a bridge member selected from the group consisting of



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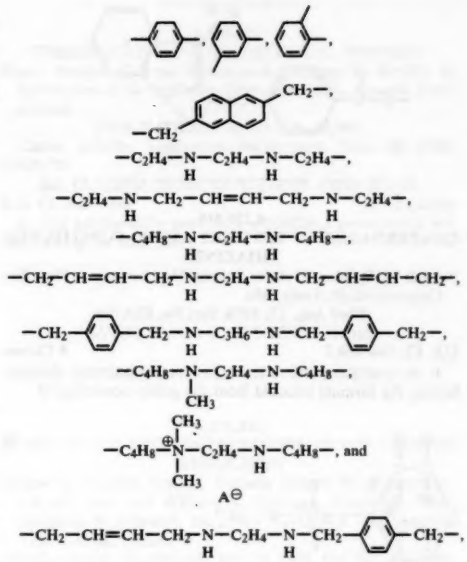


n is 2, 3 or 4,

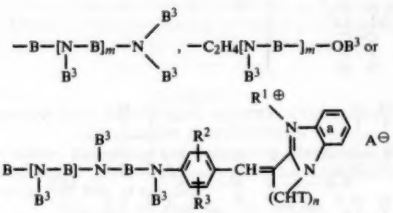
T is hydrogen or C_1–C_4-alkyl,

R^2 is hydrogen, methyl, ethyl, hydroxyl, methoxy or ethoxy,

R^3 is hydrogen, chlorine, methyl or ethyl,

B^1 is hydrogen or unsubstituted or substituted alkyl,

B^2 is a radical of the formulae:



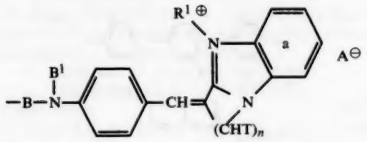
m is 0, 1, 2 or 3,

the radicals B^3 independently of one another are hydrogen, C_1–C_4-alkyl, or C_2–C_3-alkyl which is substituted by —N—B^3, hydroxyl or C_1–C_4 -alkoxy, or both radicals B^3 taken together are selected from the group consisting of a pyrrolidino, piperidino, morpholino, piperazino, N-methylpiperazino, N-β-hydroxyethyl-piperazino and hexamethyleneimino ring,

the ring a is unsubstituted or mono or polysubstituted by hydrogen, methyl, ethyl, chlorine, nitro or dimethylamino,

provided that when R^1 is selected from the group consisting of a radical of the formula (II) and a radical containing a group of the formula

B^2 can additionally be selected from the group consisting of B^1 and

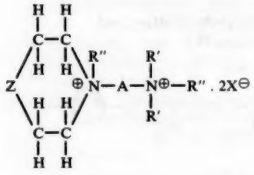


4,276,416
QUATERNARIES OF TERTIARY AMINO-SUBSTITUTED THIAZINES

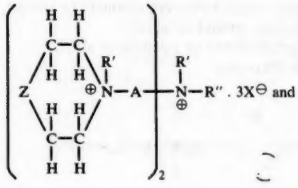
Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Aug. 12, 1976, Ser. No. 713,704
Int. Cl.³ C07D *279/12, 295/12, 417/12*
U.S. Cl. 544—58.2 **8 Claims**

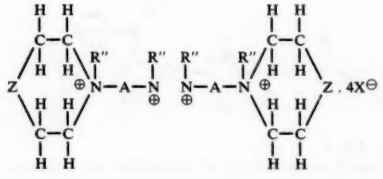
1. A quaternary of a tertiary amino-substituted thiazine having the formula selected from the group consisting of



(1)



(2)



(3)

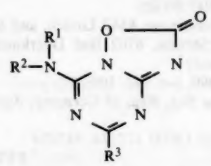
where Z is SO or SO_2, A is alkylene having 2 to 10 carbon atoms, R′ is alkyl or hydroxyalkyl, R″ is alkyl, alkenyl or alkynyl, N⌒N represents a cyclic diamine group and X is an anion selected from the group consisting of chloride, iodide, bromide, sulfate, sulfonate and carboxylate.

4,276,417
OXADIAZOLOTRIAZINE DERIVATIVES

Jean-Claude Muller, Rixheim, France, and Henri Ramuz, Birsfelden, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 26, 1979, Ser. No. 61,068
Claims priority, application Switzerland, Jul. 31, 1978, 8184/78; May 15, 1979, 4505/79
Int. Cl.³ C07D *498/04*
U.S. Cl. 544—198 **15 Claims**

1. A compound of the formula



I

wherein R^1 is hydrogen, and R^2 is a group of the formula

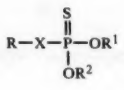
—$COOR^5$ or —$CH(R^6)COOR^7$, or R^1 and R^2 are the same and are hydrogen or a group of the formula —$CH(R^6)COOR^7$, R^3 is diallylamino or 1,2,5,6-tetrahydropyridin-1-yl, wherein R^4 is alkyl of 1–8 carbon atoms, haloalkyl of 1–8 carbon atoms, alkoxy of 1–8 carbon atoms-alkyl of 1–8 carbon atoms, benzyloxy-alkyl of 1–8 carbon atoms, phenethyloxy-alkyl of 1–8 carbon atoms, phenyloxy-alkyl of 1–8 carbon atoms, alkoxy of 1–8 carbon atoms-carbonylalkyl of 1–8 carbon atoms, benzyl, phenethyl, phenyl, halophenyl, dihalophenyl, methoxyphenyl, dimethoxyphenyl, nitrophenyl, tolyl, methoxycarbonylphenyl, naphthyl, a group of the formula —$C(R^8)$=$CH(R^9)$, alkoxy of 1–8 carbon atoms-carbonylalkyl of 1–8 carbon atoms-carbonyl or a 4-membered to 7-membered heterocyclic group selected from the group consisting of furyl, nicotinyl, isonicotinyl, pyridyl, thienyl, pyrrolinyl and piperidinyl, which is optionally bound via a methylene group, R^5 is alkyl of 1–8 carbon atoms, alkoxy of 1–8 carbon atoms-alkyl of 1–8 carbon atoms, benzyl, phenethyl, phenyl, halophenyl, dihalophenyl, methoxyphenyl, dimethoxyphenyl, nitrophenyl, tolyl, methoxycarbonylphenyl, naphthyl or allyl, R^6 is hydrogen or alkyl of 1–8 carbon atoms, R^7 is alkyl of 1–8 carbon atoms and R^8 and R^9 each are alkyl of 1–8 carbon atoms, benzyl, phenethyl, phenyl, halophenyl, dihalophenyl, methoxyphenyl, dimethoxyphenyl, nitrophenyl, tolyl, methoxycarbonylphenyl, naphthyl, or a 4-membered to 7-membered heterocyclic group, selected from the group consisting of furyl, nicotinyl, isonicotinyl, pyridyl, thienyl, pyrrolinyl and piperidinyl, or a salt thereof with a pharmaceutically acceptable base.

4,276,418
PROCESS FOR THE PURIFICATION OF ESTERS OF PHOSPHORUS THIOACIDS

Michael S. Howarth, Oldham, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 28, 1980, Ser. No. 116,596
Claims priority, application United Kingdom, Feb. 19, 1979, 05739/79
Int. Cl.³ C07F *9/65*
U.S. Cl. 544—243 **5 Claims**

1. A process for the purification of esters of phosphorus thioacids having the formula:



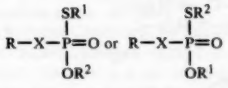
wherein

R is an organic radical which is attached via a carbon atom thereof to X;

R^1 and R^2 are optionally substituted hydrocarbon radicals which may be the same or different, and

X is O or S,

and which contains as an impurity a thiolo isomer having the formula:



in which R, R^1, R^2 and X have the previously defined meanings, which comprises washing the ester with 1 to 5% by weight aqueous sulfuric acid whereby the content of thiolo impurity in the ester is reduced to a level at which the subsequently stabilized ester does not develop objectionable odors on storage.

4,276,419

PROCESS FOR THE PREPARATION OF C-SUBSTITUTED PYRIDINES AND/OR HYDROGENATED C-SUBSTITUTED PYRIDINES, C-SUBSTITUTED QUINOLINES AND/OR HYDROGENATED QUINOLINES

Egidius J. M. Verheijen, Born, and Charles H. Geersheuvels, Geleen, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Sep. 19, 1979, Ser. No. 78,587

Claims priority, application Netherlands, Sep. 20, 1978, 7809552

Int. Cl.³ C07D *211/04, 211/06, 215/06, 295/02*

U.S. Cl. 546—164 **5 Claims**

1. In a process for the preparation of pyridines and/or hydrogenated pyridines that have been substituted with a hydrocarbon group at one or more carbon atoms, by the steps of:

passing a γ-cyanoketone, in a gaseous phase in the presence of hydrogen, over a first catalyst in a reaction zone containing a catalytically active component selected from the group consisting of copper, silver, gold, iron, nickel, cobalt, ruthenium, rhodium, palladium, osmium, iridium, platinum and compounds thereof, thereby forming a reaction mixture containing said substituted pyridines and/or hydrogenated pyridines and hydrogen;

separating a hydrogen-containing gas from said reaction mixture; and

recycling at least a portion of said hydrogen-containing gas to said reaction zone,

the improvement wherein said hydrogen-containing gas, prior to being recycled to said reaction zone, is passed over a second catalyst containing a catalytically active component selected from the group consisting of iron, nickel, cobalt and compounds thereof at a temperature of between about 300° and 800° C.

4,276,420

HERBICIDAL AND PLANT-GROWTH-REGULATING 1,2,4-TRISUBSTITUTED-1,2,4-TRIAZOLIDIN-3-ONE-5-THIONE

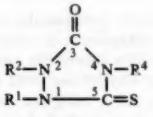
Stephen D. Ziman, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 909,140, May 24, 1978, abandoned. This application Feb. 9, 1979, Ser. No. 10,669

Int. Cl.³ C07D *249/12*

U.S. Cl. 548—264 **7 Claims**

1. A compound of the formula



wherein R^1 is alkyl of 1 to 3 carbon atoms and R^2 is alkyl of 1 to 3 carbon atoms, alkenyl of 2 to 6 carbon atoms, alkoxyalkyl of 2 to 6 carbon atoms and alkylthioalkyl of 2 to 6 carbon atoms, and R^4 is p-halophenyl wherein halo is fluoro, chloro, bromo or iodo.

4,276,421

CYANO-GUANIDINE GEOMETRICAL ISOMERS

Pierre Baudet, Geneva, Switzerland, assignor to Société de Recherches et de Syntheses Organiques S.A., Geneva, Switzerland

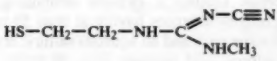
Filed Nov. 15, 1979, Ser. No. 94,660

Claims priority, application Switzerland, Nov. 18, 1978, 11810/78

Int. Cl.³ C07D *233/64;* **C07C** *129/08;* **C07D** *203/06*

U.S. Cl. 548—342 **3 Claims**

1. The substantially pure Syn(—$NHCH_3$) geometrical isomer having the structure



on a therapeutically acceptable acid addition salt thereof.

4,276,422

SUBSTITUTED DITHIIN TETROXIDE PLANT GROWTH REGULANTS

Arthur D. Brewer, Guelph, Canada; Robert W. Neidermyer, Carmel, Ind., and William S. McIntire, Senatobia, Miss., assignors to Uniroyal, Inc., New York, N.Y. and Uniroyal Ltd., Guelph, Canada

Division of Ser. No. 540,020, Jan. 10, 1975, Pat. No. 4,026,906, which is a division of Ser. No. 357,757, May 7, 1973, Pat. No. 3,920,438. This application Mar. 7, 1977, Ser. No. 774,842

The portion of the term of this patent subsequent to May 31, 1994, has been disclaimed.

Int. Cl.³ C07D *339/08*

U.S. Cl. 549—15 **7 Claims**

1. 2-Ethyl-5,6-dihydro-5-methyl-1,4-dithiin 1,1,4,4-tetroxide.
2. 2-Ethyl-5,6-dihydro-6-methyl-1,4-dithiin 1,1,4,4-tetroxide.
3. 2-Ethyl-2,3-dihydro-5-methyl-1,4-dithiin 1,1,4,4-tetroxide.
4. 2-Ethyl-2,3-dihydro-6-methyl-1,4-dithiin 1,1,4,4-tetroxide.
5. 2,5-Diethyl-2,3-dihydro-1,4-dithiin 1,1,4,4-tetroxide.

4,276,423

PROCESS FOR PREPARING SILICON-CONTAINING ACETAMIDE DERIVATIVES

Horst Müller, Emmerting, and Volker Frey, Burghausen, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 10, 1980, Ser. No. 158,091

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1979, 2923604

Int. Cl.³ C07F *7/10*

U.S. Cl. 556—411 **6 Claims**

1. A process for the preparation of silicon-containing acetamide derivatives, which comprises reacting acetamide or substituted derivatives thereof with N-trimethylsilyl imidazole while continuously removing the silicon-containing acetamide derivatives as they are formed by distillation.

4,276,424

METHODS FOR THE PRODUCTION OF ORGANIC POLYSILANES

William R. Peterson, Jr., Fallsington, and Barry C. Arkles, Oreland, both of Pa., assignors to Petrarch Systems, Levittown, Pa.

Filed Dec. 3, 1979, Ser. No. 99,266

Int. Cl.³ C07F *7/12*

U.S. Cl. 556—430 **10 Claims**

1. A method for producing organopolysilanes by reacting an organohalosilicon hydride with lithium metal or lithium-alkali

metal alloy, whereby the silicon-silicon bonds of the organopolysilanes are formed by the removal of halogen and hydrogen from the hydride.

4,276,425

PROCESS FOR PREPARING CYCLIC DIMETHYLPOLYSILOXANES

Jürgen Burkhardt, Winhöring, and Eckhart Louis, Burghausen, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 11, 1979, Ser. No. 56,485

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1978, 2839652

Int. Cl.³ C07F 7/08

U.S. Cl. 556—460 **3 Claims**

1. A process for preparing cyclic dimethylpolysiloxanes which comprises heating a mixture containing linear or branched organopolysiloxanes having at least 50 mol percent of dimethylsiloxane units and an aqueous sulfuric acid in which the aqueous sulfuric acid contains from 50 to 85 percent by weight of sulfuric acid in the absence of an organic solvent while simultaneously distilling off the cyclic dimethylpolysiloxanes thus formed.

4,276,426

PROCESS FOR THE PREPARATION OF ORGANOSILICON COMPOUNDS

Tassilo Lindner, Mehring-Öd; Norbert Zeller, Burghausen; Volker Frey, Burghausen; Rudolf Riedle, Burghausen; Peter John, Burghausen, all of Fed. Rep. of Germany, and Georg Engelsberger, Ach, Austria, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 28, 1979, Ser. No. 98,005

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1978, 2851456

Int. Cl.³ C07F 7/09, 7/08

U.S. Cl. 556—479 **7 Claims**

1. An improved process for preparing organosilicon compounds by the continuous introduction into a pipe-shaped reactor a compound having Si-bonded hydrogen, a compound containing an aliphatic multiple bond and a catalyst which promotes the addition of Si-bonded hydrogen to an aliphatic multiple bond, in which the reaction mixture is maintained in a liquid phase by the application of pressure, while the reaction mixture is being continuously removed from said reactor, the improvement which comprises continuously circulating the reaction mixture in the reactor at a rate of at least 1,000 cm per minute.

4,276,427

19,20-DIDEHYDRO-PG$_1$ COMPOUNDS

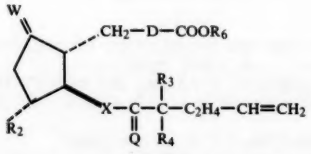
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 26,066, Apr. 2, 1979, Pat. No. 4,228,104. This application Oct. 17, 1979, Ser. No. 85,622

Int. Cl.³ C07C 177/00

U.S. Cl. 560—53 **1 Claim**

1. A compound of the formula



wherein D is

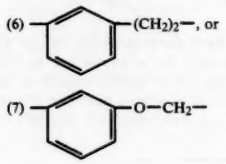
(1) $-(CH_2)_3-(CH_2)_g-CH_2-$,

(2) $--(CH_2)_3-CH_2-CF_2-$,

(3) $-(CH_2)_3-O-CH_2-$,

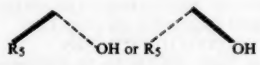
(4) $-(CH_2)_2-O-(CH_2)_2-$,

(5) $-CH_2-O-(CH_2)_3-$,



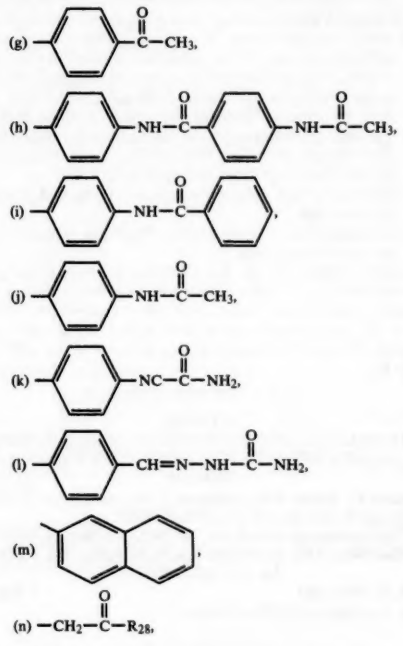
wherein g is zero, one, two, or three;

wherein Q is



wherein R_5 is hydrogen or methyl,

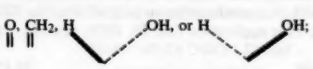
wherein R_6 is (a) hydrogen, (b) alkyl of one to 12 carbon atoms, inclusive, (c) cycloalkyl of 3 to 10 carbon atoms, inclusive, (d) aralkyl of 7 to 12 carbon atoms, inclusive, (e) phenyl, (f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive;



wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or

(o) a pharmacologically acceptable cation; wherein R_7 and R_8 are hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different; and wherein R_{29} is hydrogen, alkyl of one to 12 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive, or phenyl

substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive;
wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein W is



and wherein X is cis- or trans—CH=CH— or —C≡C—.

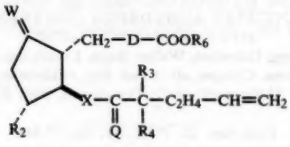
4,276,428

19,20-DIDEHYDRO-13,14-DIHYDRO-PG$_1$ COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

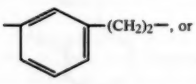
Division of Ser. No. 26,066, Apr. 2, 1979. This application Oct. 17, 1979, Ser. No. 85,623
Int. Cl.^{3} C07C *177/00*
U.S. Cl. 560—53 **1 Claim**

1. A compound of the formula

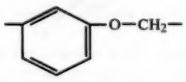


wherein D is
(1) —$(CH_2)_3$—$(CH_2)_6$—CH_2—,
(2) —$(CH_2)_3$—CH_2—CF_2—,
(3) —$(CH_2)_3$—O—CH_2—,
(4) —$(CH_2)_2$—O—$(CH_2)_2$—,
(5) —CH_2—O—$(CH_2)_3$—,

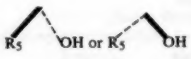
(6)



(7)



wherein g is zero, one, two, or three;
wherein Q is

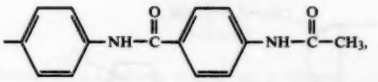


wherein R_5 is hydrogen or methyl,
wherein R_6 is (a) hydrogen, (b) alkyl of one to 12 carbon atoms, inclusive, (c) cycloalkyl of 3 to 10 carbon atoms, inclusive, (d) aralkyl of 7 to 12 carbon atoms, inclusive, (e) phenyl, (f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive;

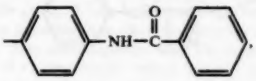
(g)

-continued

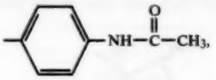
(h)



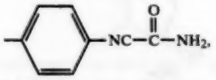
(i)



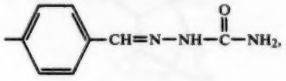
(j)



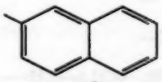
(k)



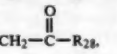
(l)



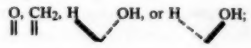
(m)



(n)



wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation; wherein R_7 and R_8 are hydrogen, alkyl of one to 12 carbon atoms, inclusive, benzyl, or phenyl, being the same or different; and wherein R_{29} is hydrogen, alkyl of one to 12 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive;
wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein W is



and wherein X is —CH_2CH_2—.

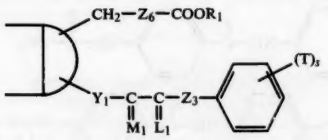
4,276,429

ω-ARYL-13,14-DIDEHYDRO-PGF COMPOUNDS

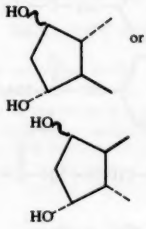
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 776,552, Mar. 7, 1977, which is a division of Ser. No. 657,739, Feb. 13, 1976, Pat. No. 4,029,681. This application Apr. 28, 1978, Ser. No. 902,210
Int. Cl.^{3} C07C *177/00*
U.S. Cl. 560—55 **38 Claims**

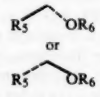
1. A prostaglandin analog of the formula:



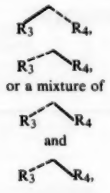
wherein D is



wherein Y_1 is —C≡C—;
wherein Z_6 is
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—, or
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
wherein g is one, 2, or 3;
wherein Z_3 is oxa or methylene;
wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;
wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro and Z_3 is methylene; and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

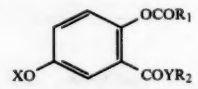
4,276,430

ANALGESIC AND ANTI-INFLAMMATORY COMPOUNDS AND COMPOSITIONS CONTAINING SAME

Herbert H. Reller, and Herbert C. Kretschmar, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 855,042, Nov. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 750,981, Dec. 15, 1976. This application Jul. 26, 1979, Ser. No. 61,107
Int. Cl.³ C07C *69/86, 69/88*
U.S. Cl. 560—66 **39 Claims**

1. A compound of the formula



wherein R_1 is an alkyl group having from 1 to 4 carbon atoms, Y is O, R_2 is an alkyl group having from 6 to 8 carbon atoms or benzyl and X is COR_3 where R_3 is an alkyl group having from 1 to 4 carbon atoms.

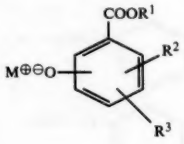
4,276,431

PROCESS FOR THE PREPARATION OF ALKALI METAL SALTS OF HYDROXYBENZOATES, WHICH ARE SUBSTANTIALLY ANHYDROUS AND FREE FROM HYDROXYBENZOIC ACID

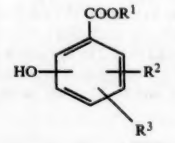
Peter Schnegg, Odenthal; Walter Rapp, Leverkusen, and Bernhard Vosteen, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 20, 1979, Ser. No. 77,445
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1978, 2842807; Apr. 27, 1979, 2917273
Int. Cl.³ C07C *69/88*
U.S. Cl. 560—67 **5 Claims**

1. Process for the preparation of alkali metal salts of hydroxybenzoates, which are substantially anhydrous and free from hydroxybenzoic acid and have the formula



in which
R^1 denotes alkyl, alkenyl, cycloalkyl or aralkyl,
R^2 and R^3 are identical or different and represent hydrogen, halogen, hydroxyl, amino, alkylamino, alkyl, alkoxy, aralkyl or aryl and
M denotes an alkali metal,
characterised in that a solution or suspension of a hydroxybenzoate of the formula



in which R^1, R^2 and R^3 have the abovementioned meaning, is neutralised with an alkali metal hydroxide at −10° to +50° C. until the degree of neutralisation is 0.95 to 1.05, a degree of

neutralisation of 1.00 denoting the end point of the neutralisation of the phenolic OH group by the alkali metal hydroxide, and the resulting solution or suspension of the alkali metal salt of the hydroxbenzoate is passed to a mild drying operation which does not damage the product and is in itself known, after a time such that the content of hydroxybenzoic acid or the alkali metal salt thereof in this solution or suspension does not reach the value of 1% by weight, relative to the amount of alkali metal salt of hydroxybenzoate contained in this solution or suspension.

4,276,432

LOW MOLECULAR WEIGHT ACRYLATES OR METHACRYLATES AND METHODS FOR THEIR PREPARATION

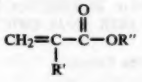
David Rhum, Westfield, N.J., and Patrick F. Aluotto, Cincinnati, Ohio, assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 666,527, Mar. 12, 1976, Pat. No. 4,075,242, which is a continuation-in-part of Ser. No. 380,314, Jul. 18, 1973, abandoned, and Ser. No. 521,723, Nov. 7, 1974, abandoned. This application May 9, 1977, Ser. No. 794,866

Int. Cl.³ C07C *69/54;* C08F *2/06, 20/12, 20/14*

U.S. Cl. 560—190 **6 Claims**

1. A process for preparing low molecular weight, room temperature liquid acrylate or methacrylate resins from monomers about 20 to 100 weight percent of which are selected from acrylate and methacrylate esters having the general formula:



wherein R′ is hydrogen or methyl and R″ is C_1–C_8 alkyl or mixtures thereof and about 0 to about 80 weight percent of which are selected from ethylenically unsaturated monomers copolymerizable therewith, wh.ch comprises:

A. heating to above about 150° C. at least 75 percent, by weight based on the total reaction solvent, of a hydrocarbon reaction solvent having a boiling point of above about 150° C. in a batch reactor;

B. adding at a temperature of above about 150° C. said monomers and the remaining solvent to the reactor over at least about 30 minutes so that the final polymerization solids of the reaction medium is above at least 30 weight percent;

C. maintaining the reaction above about 150° C. for a time sufficient to polymerize said monomers to a monomer to polymer conversion percentage of at least about 85 percent, by weight; and

D. stripping off substantially all of the reaction solvent.

4,276,433

CONTINUOUS PREPARATION OF ANTHRANILIC ACID

Gerhard Kilpper, Battenberg, and Johannes Grimmer, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 10, 1979, Ser. No. 2,333

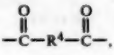
Int. Cl.³ C07C *101/54*

U.S. Cl. 562—458 **14 Claims**

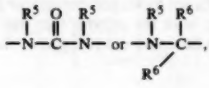
1. A process for the continuous preparation of anthranilic acid by reaction of an alkali metal phthalamate and/or alkali metal phthalimidate with a hypohalite in an aqueous medium, wherein the reaction is carried out in the presence of a catalylic amount of bromine, iodine and/or amide of the formula

wherein R^1 is a sulfonic acid group, a sulfonate radical or a sulfonamide group, R^2 is a hydrogen atom, an aliphatic radical, chlorine or bromine, X is chlorine, bromine or hydrogen, and R^1 and R^2 may also, together with the adjacent nitrogen, be members of a heterocyclic radical which contains at least one sulfone group or phosphonyl group of formula

where R_3 is hydrogen or an alkali metal, adjacent to the nitrogen and R^1 and R^2 may also together be



where R^4 is alkylene,



R^5 is hydrogen, chlorine or bromine and R^6 is an aliphatic radical, wherein

(a) phthalimide and/or phthalamic acid is dissolved in an aqueous alkali metal hydroxide solution in a ratio of from 3 to 3.5 moles of alkali metal hydroxide per mole of phthalimide and/or of from 2 to 2.5 moles of alkali metal hydroxide per mole of phthalamic acid,

(b) the resulting aqueous solution of alkali metal phthalamate and/or phthalimidate is mixed with an aqueous solution of an alkali metal hypochlorite in a mixing apparatus,

(c) the resulting mixture is reacted in the first part of a reaction tube at a high flow rate, at from 10° to 54° C., under substantially adiabatic conditions, thereafter

(d) the reaction mixture which leaves the first part of the reaction tube at a high flow rate is allowed to complete the reaction in the second part of the said tube at from 55° to 90° C. and

(e) anthranilic acid is isolated in the conventional manner from the alkaline reaction mixture which leaves the tube.

4,276,434

19,20-DIDEHYDRO-13,14-DIHYDRO-PG$_1$, SULFONYL AMIDES

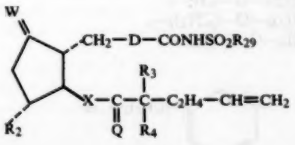
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 26,066, Apr. 2, 1979. This application Oct. 17, 1979, Ser. No. 85,771

Int. Cl.³ C07C *143/75;* A61K *31/18*

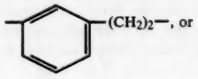
U.S. Cl. 564—98 **1 Claim**

1. A compound of the formula

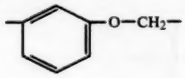


wherein D is

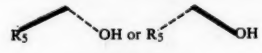
(1) $-(CH_2)_3-(CH_2)_g-CH_2-$,
(2) $-(CH_2)_3-CH_2-CF_2-$,
(3) $-(CH_2)_3-O-CH_2-$,
(4) $-(CH_2)_2-O-(CH_2)_2-$,
(5) $-CH_2-O-(CH_2)_3-$,
(6)



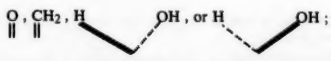
(7)



wherein g is zero, one, two, or three;
wherein Q is



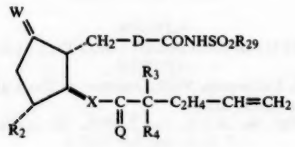
wherein R_5 is hydrogen or methyl,
wherein R_{29} is alkyl of one to 4 carbon atoms, inclusive,
wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein W is



and wherein X is $-CH_2CH_2-$.

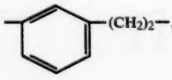
4,276,435
19,20-DIDEHYDRO-PG$_1$, SULFONYL AMIDES
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Division of Ser. No. 26,066, Apr. 2, 1979. This application Oct. 17, 1979, Ser. No. 85,772
Int. Cl.^{3} C07C *143/75;* A61K *31/18*
U.S. Cl. 564—98 **1 Claim**

1. A compound of the formula



wherein D is
(1) $-(CH_2)_3-(CH_2)_g-CH_2-$,
(2) $-(CH_2)_3-CH_2-CF_2-$,
(3) $-(CH_2)_3-O-CH_2-$,
(4) $-(CH_2)_2-O-(CH_2)_2-$,
(5) $-(CH_2-O-(CH_2)_3-$,

(6)



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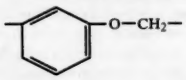
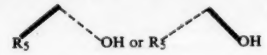
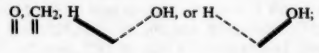
(7)



wherein g is zero, one, two, or three; wherein Q is



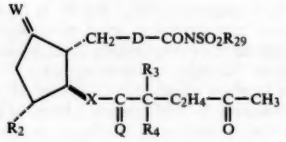
wherein R_5 is hydrogen or methyl, wherein R_{29} is alkyl of one to 4 carbon atoms, inclusive, wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl; wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein W is



and wherein X is cis— or trans—CH=CH— or —C≡C—.

4,276,436
19-KETO-PG SULFONYLAMIDES
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Division of Ser. No. 025,879, Apr. 2, 1979, abandoned. This application Mar. 20, 1980, Ser. No. 132,226
Int. Cl.^{3} A61K *31/18;* C07C *143/75*
U.S. Cl. 564—98 **5 Claims**

1. A compound of the formula



wherein D is
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(3) cis—CH_2—CH=CH—CH_2—CH_2—,
(4) trans—$(CH_2)_3$—CH=CH—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(6) —$(CH_2)_3$—CH_2—CF_2—,
(7) —$(CH_2)_3$—O—CH_2—,
(8) —(CH_2)—O—$(CH_2)_2$—,
(9) —CH_2—O—$(CH_2)_3$—,
(10) —(m—Ph)—$(CH_2)_2$—, or
(11) —(m—Ph)—O—CH_2—,
wherein —(m—Ph)— is inter-meta-phenylene and
wherein g is zero, one, two, or three;
wherein Q is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;
wherein R_{29} is hydrogen, alkyl of one to 12 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive;
wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl,
wherein R_3 and R_4 are hydrogen, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein W is oxo, methylene, α-OH:β-H, or α-H:β-OH; and

wherein X is cis— or trans—CH=CH—, —C≡C— or —CH_2CH_2—.

4,276,437

SHAPE SELECTIVE REACTIONS INVOLVING ZEOLITE CATALYST MODIFIED WITH GROUP IIIB METAL

Chin-Chiun Chu, North Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 23, 1980, Ser. No. 152,939
Int. Cl.³ C07C *2/68, 5/22, 5/52*
U.S. Cl. 585—467 **25 Claims**

1. A process for conversion of organic compounds, said process comprising contacting said organic compounds with a crystalline zeolite catalyst at a temperature of between about 250° C. and about 750° C. and a pressure within the approximate range of 10^5 N/m^2 to 10^7 N/m^2, said zeolite being characterized by a silica to alumina mole ratio of at least 12 and a constraint index within the approximate range of 1 to 12, said zeolite having undergone prior modification by treatment with one or more compounds containing metal elements of Group IIIB to deposit thereon at least 0.25 weight percent of such element.

14. The process of claim **1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12** or **13** wherein said conversion comprises the alkylation of an aromatic compound by contacting said compound with an alkylating agent to produce dialkylbenzene compounds wherein the 1,4-dialkylbenzene isomer is present in excess of its normal equilibrium concentration.

18. The process of claim **1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12** or **13** wherein said conversion comprises the transalkylation of aromatic compounds to produce dialkylbenzene compounds wherein the 1,4-dialkylbenzene isomer is present in excess of its normal equilibrium concentration.

22. The process of claim **1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12** or **13** wherein said conversion comprises disproportionation of alkylbenzenes to produce benzene and dialkylbenzenes in which the proportion of 1,4-dialkylbenzene isomer is in excess of its normal equilibrium concentration.

4,276,438

SHAPE SELECTIVE REACTIONS WITH GROUP IB MODIFIED ZEOLITE CATALYSTS

Chin-Chiun Chu, North Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 27, 1980, Ser. No. 153,364
Int. Cl.³ C07C *2/68, 5/22, 5/52*
U.S. Cl. 585—467 **25 Claims**

1. A process for conversion of organic compounds, said process comprising contacting said organic compounds with a crystalline zeolite catalyst at a temperature of between about 250° C. and about 750° C. and a pressure within the approximate range of 10^5N/m^2 to 10^7N/m^2, said zeolite being characterized by a silica to alumina mole ratio of at least 12 and a constraint index within the approximate range of 1 to 12, said zeolite having undergone prior modification by treatment with one or more compounds containing elements of Group IB to deposit thereon at least 0.25 weight percent of such element.

14. The process of claim **1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12** or **13** wherein said conversion comprises the alkylation of an aromatic compound by contacting said compound with an alkylating agent to produce dialkylbenzene compounds wherein the 1,4-dialkylbenzene isomer is present in excess of its normal equilibrium concentration.

18. The process of claim **1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12** or **13** wherein said conversion comprises the transalkylation of aromatic compounds to produce dialkylbenzene compounds wherein the 1,4-dialkylbenzene isomer is present in excess of its normal equilibrium concentration.

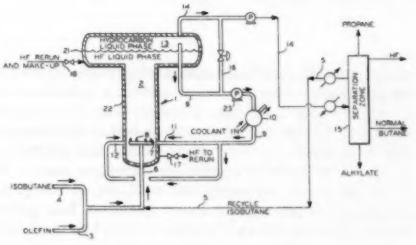
22. The process of claim **1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12** or **13** wherein said conversion comprises disproportionation of alkylbenzenes to produce benzene and dialkylbenzenes in which the proportion of 1,4-dialkylbenzene isomer is in excess of its normal equilibrium concentration.

4,276,439

CATALYTIC ALKYLATION METHOD AND APPARATUS WITH HYDROCARBON RECYCLE

Thomas Hutson, Jr.; Donald J. Makovec, and Alden E. Beckworth, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 2, 1979, Ser. No. 81,290
Int. Cl.³ C07C *3/54*
U.S. Cl. 585—720 **13 Claims**



1. An alkylation process comprising the steps of:

(a) injecting a feed hydrocarbon stream comprising an isoparaffin and at least one olefin into an alkylation catalyst bed in an alkylation zone under conditions suitable for producing an alkylate, and producing an alkylation effluent comprising the alkylate and the alkylation catalyst;

(b) passing the alkylation effluent to a phase separation zone and therein forming an upper liquid hydrocarbon phase comprising the alkylate and unreacted isoparaffin and a lower alkylation catalyst phase;

(c) withdrawing, as a recycle hydrocarbon stream, a first portion of the liquid hydrocarbon phase from the phase separation zone, cooling the recycle hydrocarbon stream, passing the cooled recycle hydrocarbon stream to the alkylation zone, and injecting the cooled recycle hydrocarbon stream directly into the alkylation catalyst bed without prior contact with the feed hydrocarbon stream;

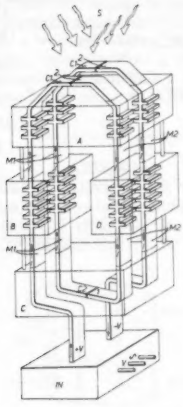
(d) withdrawing, as a product stream, a second portion of the liquid hydrocarbon phase from the phase separation zone.

4,276,440

THERMOELECTRIC GENERATOR OPERATING WITH A COOLING DEVICE FOR CONVERTING SOLAR ENERGY INTO ELECTRIC ENERGY, AND SYSTEM FOR THE USE THEREOF

Pierino Cannelli, Via Fontanellato, 52, Rome, Italy

Filed Apr. 6, 1979, Ser. No. 27,908
Claims priority, application Italy, Apr. 7, 1978, 48789 A/78; Jan. 11, 1979, 47589 A/79; Feb. 1, 1979, 47851 A/79
Int. Cl.[3] H01L *35/00*
U.S. Cl. 136—206 12 Claims



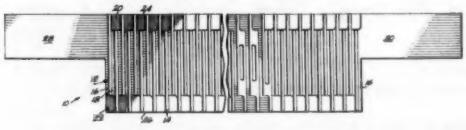
1. A generator of electric energy for the conversion from solar, thermal energy, or from any other appropriate heat source, consisting in one or more thermocouples combined with an absorption cooling device acting on one of the weldings of the thermocouple(s), wherein the thermocouple(s) are out of materials (M1, M2) provided with the most appropriate electric anc mechanic features, and wherein the absorption cooling device (A, B, C, D) is fed by the same heat supplied along the thermocouple(s) used, and said cooling system acting on that welding of the thermocouple(s) on which, by the Peltier effect, heat is developed, with the purpose of reducing of a maximum the temperature and therefore to maintain at a high level the thermal gradient between hot weldings (C1-2) and cold weldings (C2-1) of the thermocouple(s), thus obtaining a high e.m.f. value and consequently, a high power value.

4,276,441

THERMOELECTRIC GENERATOR AND METHOD OF FORMING SAME

Kenneth T. Wilson, Ocala, Fla., assignor to Wilson International Incorporated, Ocala, Fla.

Filed Feb. 15, 1980, Ser. No. 117,342
Int. Cl.[3] H01L *35/00, 35/28*
U.S. Cl. 136—206 16 Claims



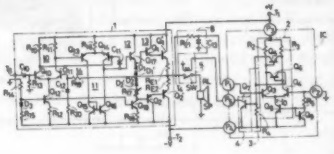
1. A thermoelectric generator device comprising a suitable substrate strip of a predetermined length and width and having a plurality of spaced apart first and second thermocouple element legs disposed generally along its length in an adjacent relationship, said legs being printed respectively in first and second inks composed of powdered metals, of different electrical conductivity, mixed in a suitable binder; said legs further including oppositely extending overlying printed couple portions at their ends to connect the legs of different conductivity in a manner whereby said legs are electrically coupled to define a first plurality of thermocouples in series; said powdered metals being melted on said substrate to form a solid mass of said legs and couples, with an intermingling of said first and second metals of said couples.

4,276,442

PROTECTIVE CIRCUIT

Masanori Ienaka; Masahiro Yamamura, both of Kodaira; Kazuo Watanabe, and Yasuo Kominami, both of Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 29, 1979, Ser. No. 25,039
Claims priority, application Japan, Apr. 21, 1978, 53-46536; Mar. 22, 1979, 54-32291
Int. Cl.[3] H02H *3/14, 7/20*
U.S. Cl. 179—1 A 4 Claims



1. A protective circuit for an electric circuit adapted to drive a load comprising: switching means normally connecting the output of said electric circuit to said load, detection circuit means connected to said electric circuit for detecting an electrical characteristic indicating the state of operation of said electric circuit, and means including a driving transistor controlled by the output from said detection circuit means for controlling said switching means to open the connection to said load from said electric circuit when the operation of said electric circuit results in deviation of said electrical characteristic from a predetermined range,

said detection circuit means including a detecting transistor constructed in a semiconductor integrated circuit, said detecting transistor having a first input electrode connected to receive a signal representative of said electrical characteristic of said electric circuit through an input terminal for external connection to said semiconductor integrated circuit, means for biasing said detecting transistor so as to allow a predetermined electric current to flow therethrough when the electrical characteristic of said electric circuit falls within said predetermined range, a reference transistor connected in a differential manner to said detecting transistor, said reference transistor having a first input electrode connected to receive a reference level corresponding to the level of said signal applied to said detecting transistor when the electrical characteristic of said electric circuit falls within said predetermined range, and first and second switching transistors having respective first input electrodes connected to the output electrodes of said detecting transistor and said reference transistor, in such a manner that either one of said first and second switching transistors is turned on when said output electrodes of said detecting and reference transistors take a low level and a high level, respectively, or, alternatively, when said output electrodes of said detecting and reference transistors take a high level and a low level, respectively, the output signals derived from said output electrodes of said first and second switching transistors being applied to a first input terminal of said driving transistor so that the output of said detecting transistor is applied to drive said driving transistor, by a change in said predetermined electric current caused by a change in said signal received by said first input electrode or a breakdown of said detecting transistor itself, so as to cause said driving

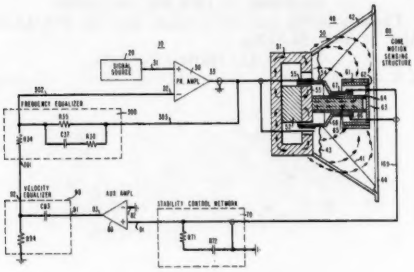
transistor to control said switching means to open the connection to said load from said electric circuit.

4,276,443

SOUND REPRODUCING SYSTEM UTILIZING MOTIONAL FEEDBACK AND VELOCITY-FREQUENCY EQUALIZATION

Stanley T. Meyers, 122 N. Riverside St., Red Bank, N.J. 07701

Filed Aug. 17, 1979, Ser. No. 67,515
Int. Cl.³ H04R *3/04*
U.S. Cl. 179—1 F **14 Claims**



1. A sound reproducing system comprising:
first amplifying means being jointly responsive to an input source signal and to a second equalizer output signal;
sound energy producing means being responsive to said first amplifying means;
means for sensing the sound energy output of said sound energy producing means thereby providing a motional feedback signal;
second amplifying means being responsive to said motional feedback signal for producing a second amplifying means output signal;
first equalizer means being responsive to said second amplifying means output signal for producing a first equalizer means output signal, said first equalizer means loss characteristic exhibiting a positive slope in the range between relatively low frequencies and relatively high frequencies;
second equalizer means being associated with said first amplifying means and being responsive to said first equalizer means output signal for producing said second equalizer output signal, said second equalizer means loss characteristic exhibiting a constant value at said relatively low frequencies, a positive slope in the range between said relatively low frequencies and said relatively high frequencies, and a zero value at said relatively high frequencies;
whereby said sound energy producing means radiates a substantially uniform sound energy output in the range between said relatively low frequencies and said relatively high frequencies.

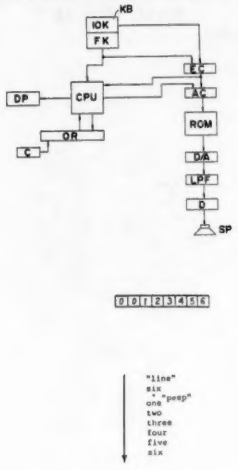
4,276,444

SYNTHETIC-SPEECH CALCULATORS

Akira Tanimoto, Kashihara; Sigeaki Masuzawa, Nara; Shinya Shibata, Nara, and Shinzo Nishizaki, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 877,883, Feb. 15, 1978, Pat. No. 4,211,892.
This application Aug. 22, 1979, Ser. No. 68,702
Claims priority, application Japan, Feb. 15, 1977, 52/17798[U]; Feb. 21, 1977, 52/19660; Feb. 25, 1977, 52/20493
Int. Cl.³ G10L *1/00*; G06F *3/16*
U.S. Cl. 179—1 SM **7 Claims**

1. A synthetic speech calculator comprising:
means for entering data into said calculator; and
audible sound generating means responsive to actuation of said means for entering for generating audible sounds in response thereto, wherein said audible sounds comprise,
a first audible sound generated in response to actuation of said means for entering, said first audible sound indicative of a particular characteristic associated with said data,
a second audible sound generated in response to the completion of generation of said first audible sound, said second audible sound being a monotone signal for separating selected groups of audible sounds, and
a third audible sound generated in response to the completion of generation of said second audible sound, said third audible sound being indicative of said data entered via said means for entering.

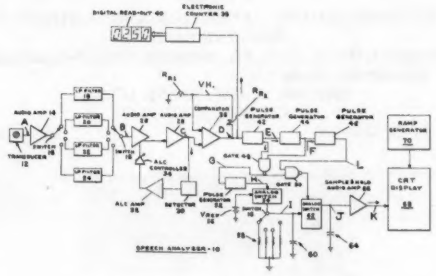


4,276,445

SPEECH ANALYSIS APPARATUS

William D. Harbeson, Boonton, N.J., assignor to Kay Elemetrics Corp., Pine Brook, N.J.

Filed Sep. 7, 1979, Ser. No. 73,201
Int. Cl.³ G10L *1/00*
U.S. Cl. 179—1 SC **6 Claims**



1. Speech analysis apparatus comprising: transducer means for converting speech sounds into electrical signals; low pass filter means connected to said transducer means for extracting the pitch frequency from the electrical signals representing the speech sounds; frequency-to-voltage generator means responsive to said low pass filter means for a generating voltage whose amplitude is a function of the pitch frequency extracted from said electrical signals; means for displaying the output of

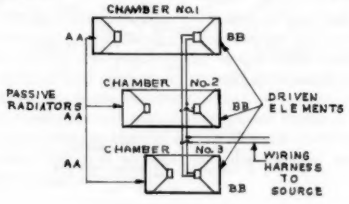
said frequency-to-voltage generating means; said frequency-to-voltage generating means further comprising pulse generating means for generating at least one pulse for each cycle of pitch frequency and converting means for converting the time between adjacent pulses to a voltage level,

wherein said pulse generating means includes means for generating two sequential pulses for each cycle of pitch frequency and wherein said converting means comprises a source of a reference voltage, a resistance-capacitance network, first switching means operative during the presence of one of the two sequential pulses for connecting said source of reference voltage to said resistance-capacitance network to establish a time decaying voltage across said network, a voltage holding means and a second switching means operative during the presence of the other of the two sequential pulses for connecting said resistance-capacitance network to said voltage holding means.

4,276,446
ACOUSTIC TRANSDUCER SYSTEM

Anthony R. Taddeo, 800 Corwin Rd., Rochester, N.Y. 14610

Filed Oct. 5, 1979, Ser. No. 82,034
Int. Cl.³ H04R *1/20*
U.S. Cl. 179—1 E **3 Claims**



1. An acoustical speaker system, comprising

a plurality of speaker housings each having therein a chamber,

an active speaker element mounted in each of said chambers adjacent one end thereof and disposed to be connected to an electrical audio signal source to be driven thereby, and

a passive speaker element mounted in each of said chambers adjacent the opposite end thereof and acoustically coupled to the associated driven speaker in said chamber, thereby to be driven by the acoustical signals developed in said chamber by said associated speaker, and

each of said chambers having a fundamental resonant frequency which is different from that of each of the other chambers.

4,276,447
SIGNAL PROCESSING APPARATUS FOR SUBSCRIBER CIRCUITS

Hirotoshi Shirasu, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 3, 1979, Ser. No. 63,470
Claims priority, application Japan, Aug. 11, 1978, 53-109471[U]; Mar. 2, 1979, 54-24138
Int. Cl.³ H04Q *3/28*
U.S. Cl. 179—18 FG **7 Claims**

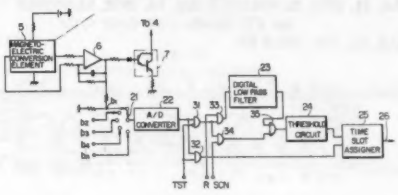
1. A signal processing apparatus for subscriber circuits comprising:

an analog signal extracting circuit provided in each of said subscriber circuits for outputting analog signals changing in accordance with a D.C. signal and a ringing signal flowing into said each subscriber circuit;

an analog multiplexing circuit connected to the output terminal of each of said plurality of extracting circuits;

an analog-to-digital converter connected to the output terminal of said analog multiplexing circuit; and

a signal processing circuit connected to the output terminal of said analog-to-digital converter and receiving successively and periodically a digital signal corresponding to the output signal of each of said extracting circuits for processing said digital signal to detect the state of each of said subscriber circuits, said reception of said digital signal being made by sending a selective signal to said analog

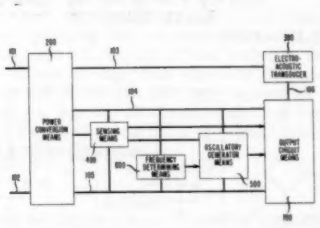


multiplexing circuit to extract said signal flowing through the circuit of a subscriber who has just been called, receiving periodically a digital signal corresponding to said extracted signal, filtering said digital signal by a low pass filter, and comparing said filtered digital signal with a threshold level to detect whether said subscriber has made a response or not.

4,276,448
ELECTRONIC TONE RINGER

Milton L. Embree; David C. Goldthorp, both of Reading, Pa., and David R. Vogelpohl, Indianapolis, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 20, 1979, Ser. No. 67,718
Int. Cl.³ H04M *1/00*
U.S. Cl. 179—84 T **18 Claims**



18. A tone ringer operatively responsive to the reception of ringing signals over input lines, the ringer comprising:

an electroacoustic transducer (300) for producing an audible output,

oscillatory generator means (500) for activating the electroacoustic transducer, characterized in that

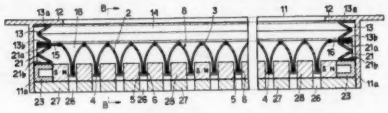
the tone ringer includes constant current generators (223, 224, 225, 226) for operation of the oscillatory generator means, and

power conversion means (200) responsive to ringing signals across the input lines for supplying energy to the constant current generators and to the electroacoustic transducer, and for providing voltage reference levels to the oscillatory generator means, the constant current generators further comprising a plurality of current mirrors connected to one or the other of a pair of output lines from the power conversion means.

4,276,449
SPEAKER OR MICROPHONE HAVING CORRUGATED DIAPHRAGM WITH CONDUCTORS THEREON

Tadashi Sawafuji, No. 9-15 Nishi-Sugamo 1-chome, Toshima-ku, Tokyo, Japan

Filed May 30, 1979, Ser. No. 43,636
Claims priority, application Japan, Jun. 1, 1978, 53/66198; Jul. 21, 1978, 53/99611[U]; Sep. 14, 1978, 53/112962
Int. Cl.³ H04R *7/14, 7/18, 9/04*
U.S. Cl. 179—115.5 PV **14 Claims**

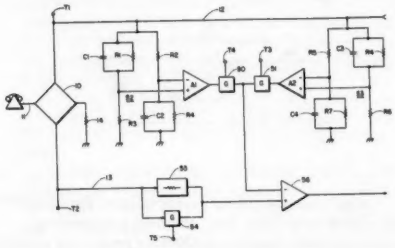


1. An acoustic transducer which includes a rectangular, thin film member which is corrugated to form a number of elongate, arcuate corrugations wherein conductors are applied in series relation on at least one surface of each trough portion and each peak portion between adjacent arcuate corrugations such that sound currents flow through the conductors on each trough portion in the same direction while the sound currents flow through the conductors on each peak portion in the opposite direction to those flowing through each trough portion, and in which rod-like permanent magnets extending parallel to the conductors on each trough portion and generating magnetic fluxes in the same direction are retained over the substantially entire length between adjacent trough portions and both surfaces of each side edge of the diaphragm are supported by support members which are expandable and contractable only in the direction extending perpendicularly to the diaphragm.

4,276,450
METHOD AND APPARATUS FOR IMPROVING TELEPHONE HYBRID NETWORK

Adam Chowaniec, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 5, 1979, Ser. No. 72,365
Int. Cl.³ H04B *3/20*
U.S. Cl. 179—170 D **2 Claims**



1. A circuit for improving the singing return loss between the opposed four-wire input and output of a hybrid network for the two-wire to four-wire interface of a telephone line, comprising:

a signal generator for connecting a transmit test signal to said input;

characterized by:

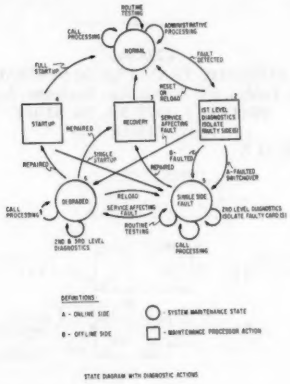
means for determining whether the phase of the return test signal at said output relative to the transmit test signal at said input is within a preselected range for inductively loaded lines;

a control circuit responsive to the phase determining means for connecting a first impedance network between the four-wire input and output of the hybrid network when the return test signal is within said range, and for connecting a second impedance network between the four-wire input and output when the return test signal is outside said range.

4,276,451
CONTROL SYSTEM FOR TELEPHONE SWITCHING SYSTEM

Otto W. Beebe, Maitland; Ernest O. Lee, Longwood; Richard I. Subrin, Alta Monte Springs; Barrie Brightman, Fern Park, all of Fla., and George C. Hanson, San Antonio, Tex., assignors to Stromberg-Carlson Corporation, Tampa, Fla.

Filed Feb. 9, 1979, Ser. No. 10,910
Int. Cl.³ H04M *3/22;* **H04Q** *3/54*
U.S. Cl. 179—175.2 C **24 Claims**



STATE DIAGRAM WITH DIAGNOSTIC ACTIONS

1. A telephony system for routing communications over a plurality of telephone lines, said system comprising:

A. port connection means connected to the telephone lines for receiving signals therefrom and for transmitting signals thereto,

B. first and second, parallel, independently operable call processing means for interconnecting, on a selective basis, certain of the telephone lines, each said call processing means operating concurrently in response to the same signals from said port connection means by generating output signals,

C. synchronizing means connected to both said call processing means for synchronizing the operation of said first and second call processing means,

D. controllable switching means interposed between said port connection means and both said call processing means for coupling the output signals from a selected one of said call processing means to said port communications means to complete communications between said port connection means and the selected one of said call processing means,

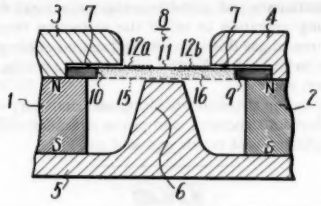
E. fault monitoring means connected to each of said call processing means for generating fault signals in response to fault conditions in said call processing means, and

F. switchover means connected to said fault monitoring means and said controllable switching means and operable independently of both said call processing means for testing each said call processing means in response to certain of said fault signals thereby to identify one of said call processing means as the source of the fault condition and to cause said controllable switching means to couple output signals from the other of said call processing means to said port connection means.

4,276,452
MEMBRANE TYPE ELECTRO-ACOUSTIC TRANSDUCER

Hideo Suyama, Yokohama, and Masana Ugaji, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 2, 1979, Ser. No. 63,032
Claims priority, application Japan, Aug. 15, 1978, 53-99293
Int. Cl.³ H04R 7/26
U.S. Cl. 179—180 **7 Claims**

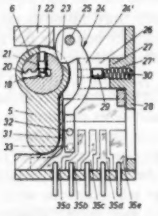


1. An electro-acoustic transducer comprising:
(a) a magnetic circuit structure having at least one air gap; and
(b) a vibrative structure disposed in said air gap; said vibrative structure comprising a frame member having at least one opening, a membrane fixed on said frame member so as to cover said opening, an acoustic-transparent member fixed on said frame member so as to form a space between said membrane and acoustic-transparent member, and an acoustic damping material disposed in said space in such a manner that said acoustic damping material smoothly contacts said membrane.

4,276,453
ELECTRIC SWITCHING DEVICE ON A ROTARY CYLINDER LOCK

Heinz Wolter, Kürten, Fed. Rep. of Germany, assignor to DOM-Sicherheitstechnik GmbH & Co. KG, Brühl, Fed. Rep. of Germany

Filed Dec. 14, 1979, Ser. No. 103,794
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1978, 2854424
Int. Cl.³ H01H 27/00, 27/06
U.S. Cl. 200—44 **16 Claims**

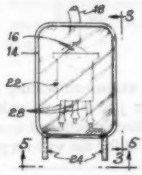


1. In an electric switching device on a rotary cylinder lock having a rotatable core and with core pins which are controlled by a key, the stroke of the core pins bringing contact lugs in contact position relative to a counter-contact surface, the improvement comprising
a plurality of counter-contact surfaces being adjacent to each other and formed into a row,
at least one transmission lever having a free end forming a contact lug,
at least one core pin constituting means for being controlled by the form of the key and for operatively acting on said transmission lever for moving the latter dependent on the extent of control of the core pin by the form of the key,
said transmission lever being mounted relative to said row of counter-contact surfaces such that via said core pin which is controlled by the form of the key, said contact lug is slidable over at least a portion of said row of counter-contact surfaces.

4,276,454
WATER LEVEL SENSOR

William J. Zathan, 1883-2 Pepper Valley La., El Cajon, Calif. 92021

Filed Mar. 19, 1979, Ser. No. 21,691
Int. Cl.³ H01H 29/00
U.S. Cl. 200—61.05 **1 Claim**



1. A sensing device for determining the level of a fluid comprising:
(a) an electrical connector connected to a lead cable with a three-wire breakout and defining three parallel downwardly directed sockets connected respectively to said three wires;
(b) two pre-formed conductor elements plugged into two of said three sockets and defining respectively two depending probes each having an insulation sheath completely covering same except for the tip thereof;
(c) a third pre-formed conductor element plugged into the third of said sockets and defining a horizontally extended probe having an insulation sheath completely covering same except for the tip thereof; and
(d) a solid block of an insulating, impermeable mass completely encapsulating said connector and said conductor elements except for the ends of said probes so that the exterior surface of said block intersects the insulation sheaths of said probes and said cable beyond the three-wire breakout, whereby all elements extending from said block are imbedded in said block up to and beyond their areas of greatest insulation.

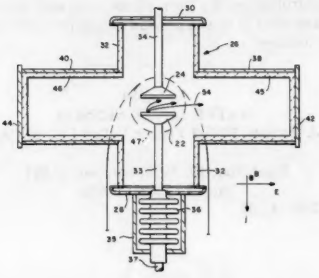
4,276,455
VACUUM ENVELOPE FOR CURRENT LIMITER

Clive W. Kimblin, and Paul G. Slade, both of Pittsburgh, Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Aug. 5, 1977, Ser. No. 822,198
Int. Cl.³ H01H 33/66
U.S. Cl. 200—144 B **17 Claims**

1. A current interrupter for rapidly interrupting currents associated with power line faults comprising: an evacuated envelope having spaced end portions and an intermediate insulating portion sealed to said end portions, a pair of electrode members within said envelope each supported by one of said end portions of said envelope, said electrode members being relatively movable within said envelope into mutual contact to complete an electrical path and also being separable to induce current interruption wherein an arc arises between said electrode members after separation carrying current generally along a current path j, said insulating portion of said envelope being spaced from and surrounding said electrode members, and means for producing a magnetic field between said electrode members having lines of magnetic force oriented

along a direction B which is perpendicular to said current path j to deflect an arc current flowing along current path j in the j X B direction, said insulating portion including a pair of protruding portions which extend outwardly from said electrode member along direction j X B to provide a pair of interior concavities in said envelope positioned to correspond substantially with direction j X B for the various polarities of j and B.

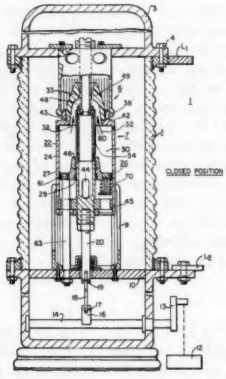


4,276,456

DOUBLE-FLOW PUFFER-TYPE COMPRESSED-GAS CIRCUIT-INTERRUPTER

Charles F. Cromer, Penn Township, Allegheny County, and Kue H. Yoon, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 23, 1978, Ser. No. 953,503
Int. Cl.³ H01H *33/88*
U.S. Cl. 200—148 A **4 Claims**



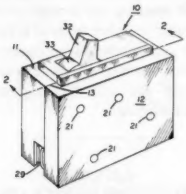
1. A puffer-type gas-insulated circuit interrupter comprising:
a stationary contact structure including stationary main and arcing contacts;
a cooperable movable contact structure including a movable main contact, a movable arcing finger contact assembly including a cluster of circumferentially-disposed arcing contact fingers having longitudinal slots between the finger portions thereof, and a tubular sleeve shield disposed in encompassing relationship with said movable cluster of arcing contact fingers to prevent premature leakage of compressed gas through said longitudinal slots during the opening operation;
means defining a relatively-stationary piston structure having a plurality of metallic cooling vanes spaced apart and protruding in the general direction of said stationary contact structure;
a movable operating cylinder movable over said piston structure and carrying said movable contact structure;
a movable hollow insulating nozzle movable with said movable operating cylinder, said hollow nozzle encompassing said stationary arcing contacts and said movable arcing contact fingers when in the closed position,
a gas compressed between said operating cylinder and said piston structure during an opening operation and flowing through said hollow nozzle into the arc drawn between said stationary and movable contact structures during the opening operation to effect the extinction thereof, said compressed gas flowing over said spaced cooling metallic vanes to be cooled thereby prior to the gas injection into the arc; and
an outer casing structure enclosing said stationary and movable contact structures, said piston structure, said operating cylinder, said nozzle and said gas.

4,276,457

CIRCUIT BREAKER HAVING PLANAR CRADLE WITH EDGE PORTIONS PROVIDING RELATCHING AND CONTACT KICKER FUNCTIONS

Felix E. Myers, Cherry Hill, N.J., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jul. 30, 1979, Ser. No. 62,442
Int. Cl.³ H01H *73/50*
U.S. Cl. 200—153 G **9 Claims**



1. A circuit breaker including a stationary contact, a movable contact, a movable contact arm, an operating member, a contact operating spring, a releaseable cradle, releasable latch means for holding said cradle in a reset position, and a narrow housing to which said member and said cradle are movably mounted on respective first and second pivots extending widthwise of said housing; said operating member including a manually engageable forward portion disposed externally of said housing at the front thereof and a rear portion within said housing connected at a third pivot to said arm at its forward end; said movable contact being at the rear of said arm and being engageable with and disengageable from said stationary contact; said spring being connected to said cradle and said arm, and exerting a force component urging said arm forward; with said cradle in said reset position, as said member moves between circuit breaker Open and Closed positions, said third pivot being moved to opposite sides of the line of action for said spring whereby the latter operates said arm to respectively disengage and engage said contacts; with said cradle released by said latch means, said spring operates said cradle to a tripped position and said member to a trip indicating position intermediate said Open and Closed positions; said cradle being a relatively thin planar member; said rear portion of said operating member including a reset formation engageable with a resetting edge formation integrally formed with said cradle whereby with said cradle tripped, operation of said member from said trip indicating position to said Off position causes said reset formation to engage said resetting edge and thereby move said cradle to said reset position; said cradle further including a latching tip engageable by said latch means; said tip and said first pivot being at opposite ends of said cradle; said spring being connected to said cradle at a connecting point intermediate the ends of said cradle; and said resetting edge

formation being disposed between said tip and said connecting point.

4,276,458

SWITCH ARRANGEMENT WITH SWITCH CONTACTS WHICH CAN BE CHANGED AS DESIRED TO NORMALLY OPEN OR NORMALLY CLOSED OPERATION

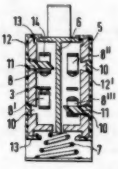
Siegfried Alter, Solingen-Gräfrath, Fed. Rep. of Germany, assignor to Metzenauer & Jung GmbH, Wuppertal, Fed. Rep. of Germany

Filed Oct. 31, 1979, Ser. No. 89,812

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1978, 2848105

Int. Cl.³ H01H *3/14*

U.S. Cl. 200—153 J **12 Claims**



1. In a switch arrangement with switches fully equipped both for normally closed and for normally open switch operation, in which, by an insulating part which can be selectively placed operatively with respect to the contact pieces cooperating as breaker or the contact pieces cooperating as maker, the contact pieces defining cooperative contact places, one type of switch operation respectively in each case is blocked, the improvement comprising

a housing, the contact pieces are operatively disposed inside of said housing,

an insulating part is formed with abutment stops, said insulating part is mountable on said housing in two selective installed positions, in both of the installed positions said abutment stops are disposed outside of the contact places and operatively abut and block one of the cooperating contact pieces from making contact, with an air space between said cooperating contact pieces.

4,276,459

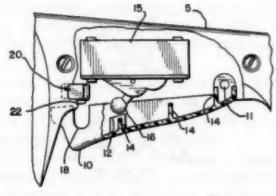
PADDLE SWITCH SAFETY BUTTON

Daniel E. Willett, West Springfield; John A. Boothroyd, Amherst, and William F. Langlais, Greenfield, all of Mass., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jun. 16, 1980, Ser. No. 159,912

Int. Cl.³ H01H *3/20, 21/04*

U.S. Cl. 200—157 **3 Claims**



1. A safety switch assembly comprising:

a substantially linear elongate paddle switch lever attached to a tool at its one end by pivot means;

said paddle switch lever having a hollow U-shaped cross-section with a recess formed in each of the opposite wall sections of the "U";

said recess being formed in the other end of said paddle switch lever;

a safety button means mounted for translation along an axis perpendicular to the longitudinal axis of said elongate paddle switch lever;

a first portion of said safety button means having a cross section which fits into said recess;

a second portion of said safety button means having a cross section which interferes with said paddle switch lever to prevent its rotation about said pivot means, whereby the paddle switch is prevented in its operation;

said safety button means being located towards the other end of said paddle switch lever;

said safety button means being comprised of a multi cross section plunger element which coacts with said recess when said safety button means is translated along its axis from its normal position to its depressed position; and

said safety button means being biased towards its normal position by a spring.

4,276,460

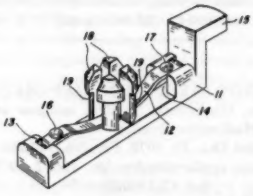
PRINTED CIRCUIT BOARD SWITCH

Barry F. Haesly, Richardson, and Hall E. Jarman, Princeton, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 29, 1979, Ser. No. 42,847

Int. Cl.³ H01H *9/00*

U.S. Cl. 200—292 **5 Claims**



1. A switch subassembly adapted for combination with a circuit board comprising:

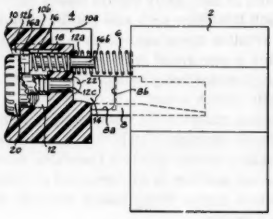
(a) a non-conducting elongated housing shaped to include a circular post sized for insertion into opening on said circuit board and having a beveled outer edge, the outermost length of the post shaft having a larger diameter than the innermost part, creating a shoulder at the junction of the two sizes of the post; said post having a first slot cut therein, the centerline of said slot in said post coincidental with the centerline of the housing base long dimension, also said post having a second slot cut therein, perpendicular to said first slot; said housing also including a raised section on either end, each said section having a notch cut into the raised section, said notch having the same width and a centerline coincident with said centerline of said first notch; said housing also to include a handle at one end of housing; and

(b) a conductive spring, formed as a flat ribbon, having two contact surfaces, with a concave shape between the two contact surfaces, and each end bent downward to provide support for said contact surfaces, located in said housing in said first slot in said shaft, the ends of said spring fitted in said notches cut into raised sections of said housing.

4,276,461
ADJUSTABLE TRIGGER STOP

Earl T. Piber, Oconomowoc, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 1, 1979, Ser. No. 90,116
Int. Cl.³ H01H *9/06*
U.S. Cl. 200—329 **8 Claims**



1. In an electric switch having a housing enclosing electric power control means including an actuatable switch operating lever extending from said housing, an integral adjustable stop for selecting any one of a multiplicity of operating positions to which said switch operating lever may be actuated comprising:

a spring-biased stop member mounted within said operating lever for movement toward said housing thereby to vary the amount that said switch operating lever may be actuated before said stop member abuts said housing;

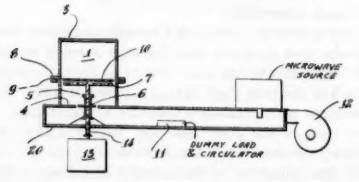
a rotary adjusting member mounted in said switch operating lever and comprising a sloping track engaging said spring-biased stop member;

and said spring-biased stop member and said sloping track of said rotary adjusting member having inter-engaging means for adjusting and retaining said spring-biased stop member in any one of a multiplicity of abutment positions relative to said housing according to the direction and amount of rotation of said rotary adjusting member.

4,276,462
MICROWAVE HEATING APPARATUS

Per O. Risman, Huskvarna, Sweden, assignor to Husqvarna Aktiebolag, Huskvarna, Sweden

Filed Dec. 29, 1978, Ser. No. 974,606
Claims priority, application Sweden, Jan. 2, 1978, 7800016
Int. Cl.³ H05B *6/74*
U.S. Cl. 219—10.55 F **11 Claims**

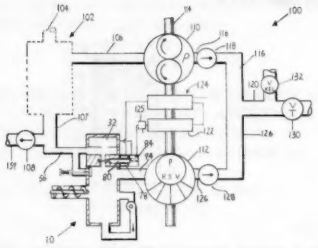


1. In a microwave heating apparatus including a cylindrical chamber having a circular wall at one end, a microwave source and means directing microwaves from said source to said chamber, the improvement wherein said directing means comprises a coaxial transmission line extending through the center of said circular wall of said chamber, and a sonde antenna terminating said line in said chamber, for supplying electric energy to said chamber, microwave transparent load positioning means shaped to position a disc-shaped load in a plane normal to the axis of said chamber at a distance approximately half the height of the chamber from said sonde antenna, said chamber having a height z_o between $0.8r_o$ and $4r_o$, wherein r_o is the chamber radius, and wherein the diameter of said chamber is between 0.77 times the wavelength of said microwaves and the diameter of the chamber for empty resonance for TM_{011} mode microwaves, whereby said chamber will be resonant for water containing disc-shaped loads on said supporting means in the TM_{011} mode and will support microwaves in the TM_{010} mode in the absence of water in said load.

4,276,463
LASER POWERED SOLID FUEL DISINTEGRATOR

Wellesley R. Kime, 8745 Appian Way, Los Angeles, Calif. 90046

Filed Jun. 14, 1979, Ser. No. 48,469
Int. Cl.³ B23K *26/14;* **B02C** *19/18, 23/24*
U.S. Cl. 219—121 LB **14 Claims**



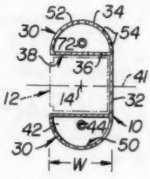
1. A laser powered solid fuel disintegrator having a housing closed to the atmosphere, means for the intake of solid fuel particles into the housing, means for replacing oxygen from the interior of the housing by replacing the oxygen with a gaseous substance comprising essentially nitrogen, means for applying laser beams to the solid fuel particles for disintegration of the fuel particles and production of disintegration fuel, means for discharging a mixture of disintegration fuel and nitrogen from the housing, further comprising:

a control unit for controlling the rate of disintegration of the solid fuel particles by the laser beams, the control unit having means for passing the fuel mixture through the control unit and controlling the rate of disintegration of solid fuel particles by the laser beams with respect to the volume flow of the fuel mixture passed through the control unit.

4,276,464
FUME EXTRACTING DEVICE FOR A WELDING APPARATUS

Melvin L. Forney, Metamora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 23, 1978, Ser. No. 958,574
Int. Cl.³ B23K *9/16*
U.S. Cl. 219—136 **5 Claims**



1. A welding device **(10, 12, 64)** comprising in combination:

a welding gun **(12)** having a central plane **(41)** transverse to a normal direction of longitudinal movement of the gun **(12)**; and

a fume extracting and gas shielding device **(10,64)** including first and second body portions **(30)** individually having an

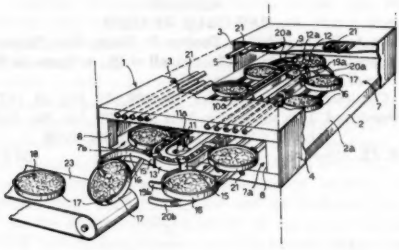
exterior surface (52), an internal fume collecting chamber (50) and a plurality of fume inlet passages (54) connecting said chamber (50) and said exterior surface (52); bridging means (32) for maintaining said first and second body portions (30) in a preselected aligned relationship to each other substantially symmetrically on the opposite sides of said central plane (41) and said welding gun (12), said bridging means (32) and said first and second body portions (30) defining elongate cavity (38) of a construction sufficient for receiving a portion of said welding gun (12), and said bridging means (32) being of a construction sufficient for being releasably connected to said welding gun (12); and first and second gas shielding devices (64), said first shielding device (64) being connected to said first body portion (30) and said second shielding device (64) being connected to said second body portion (30).

4,276,465

ELECTRIC OVEN FOR THE CONTINUOUS BAKING OF PIZZAS

Rinaldi Flavio, Massa, Italy, assignor to Superforni Rinaldi S.p.A., Italy

Filed Jun. 1, 1978, Ser. No. 911,492
Int. Cl.³ A21C *1/42*
U.S. Cl. 219—388 **13 Claims**



1. An electric oven for the continuous baking of a food product in baking tins, comprising:

a structure defining a baking chamber;

heater means in said baking chamber;

a continuously driven conveyor means for conveying in succession through said baking chamber a number of food products placed in individual baking tins, and access means affording access to the conveyor means from outside the baking chamber for the loading of food products to be baked and the unloading of baked food products wherein the improvement comprises:

said access means defining an opening defined in the front of the baking chamber through which said chamber is accessible from the outside;

said conveyor means comprising a horizontal endless conveyor provided with a plurality of pallet members and having support and drive wheels with vertical axes of rotation;

said conveyor extending longitudinally within the baking chamber and defining within said chamber two contiguous areas both of which are accessible from outside the oven through the said front opening;

a horizontal support track comprising at least two spaced rails extending longitudinally within said two areas of the baking chamber below the pallet members of said conveyor, said baking tins having a bottom surface which is directly exposed to heat generated by said heating means in said baking chamber and being slidable along said support track, and

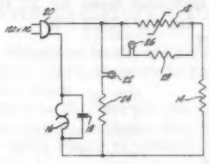
said support track projecting outside the baking chamber through said front opening for readily loading baking tins into the oven and readily unloading baking tins therefrom including a first end portion defining a horizontal loading portion on which said baking tins are positioned for subsequent engagement by said conveyor means for transportation through said baking chamber and a second end portion being sloped downwardly from said horizontal support track defining a discharge portion for disengaging said baking tins from said conveyor means.

4,276,466

HEATER WITH DISTRIBUTED HEATING ELEMENT

Lee M. Middleman, Portola Valley, Calif., and Roger S. Goodrich, Smyrna, Ga., assignors to Raychem Corporation, Menlo Park, Calif.

Filed May 11, 1979, Ser. No. 38,218
Int. Cl.³ H05B *3/80*
U.S. Cl. 219—523 **47 Claims**



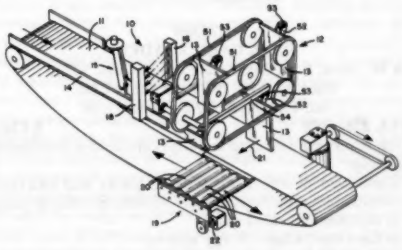
1. An article for heating a liquid comprising: (a) a water-impermeable housing fabricated from a meltable material having a notched Izod impact strength of at least about 0.5 ft-lbs/in. and (b) a flexible heating element within the housing and in intimate engagement with the housing, the flexible heating element being capable of providing from about 1 to about 10 watts per square inch of surface area of the heating element.

4,276,467

APPARATUS FOR RECEIVING EMPTY BEVERAGE CONTAINERS

Gregory T. Dubberly, Atlanta, Ga., and Robert J. McGowan, Xenia, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Jul. 17, 1978, Ser. No. 924,855
Int. Cl.³ G06M *7/00*
U.S. Cl. 235—92 PK **19 Claims**



1. In an apparatus for receiving empty containers comprising conveyor means for accepting said containers and carrying them to a storage area, alignment means for aligning said containers in single file along said conveyor means, illumination

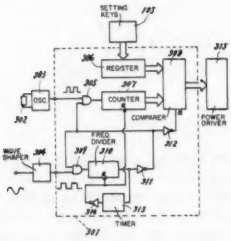
means for directing illumination across the path of movement of said containers, photosensing means for generating sensing signals indicating the presence of a container within said illumination, and identification means responsive to said photosensing means for identifying containers being sensed thereby; the improvement wherein said identification means comprises clock means for generating clock pulses corresponding to the movement of said conveyor means, counting means for counting said clock pulses, count initiating means responsive to said sensing signals for activating said counting means to count to a predetermined minimum count when a sensing signal indicates a light-to-dark transition, and signal generating means for generating a registration signal when said sensing signal undergoes a dark-to-light transition while said counting means is counting within a predetermined counting range following said minimum count.

4,276,468

ELECTRIC HOME APPLIANCES

Shun'ichi Nagamoto, Nara, and Kazuho Sakamoto, Kyoto, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 20, 1978, Ser. No. 926,505
Claims priority, application Japan, Jul. 27, 1977, 52/90719
Int. Cl.³ G06M *3/02*
U.S. Cl. 235—92 CT **9 Claims**



1. An electric home appliance incorporating a control system comprising sensor means having an impedance value variable with variations in temperature, humidity or other state; a control circuit connected to the sensor means and including oscillator means, counter means for counting the number of oscillating output pulses from the oscillator means, and means for determining gating time for the counter means; characterized in that the oscillator means has an oscillation frequency directly defined by the impedance value of the sensor means, the oscillator means having an oscillation time constant determined by a plurality of impedance elements independent of the electric impedance of the sensor means, and change-over switch means for selectively connecting said independent impedance elements to the oscillator means.

4,276,469

DATA CARD READER

Mark W. Moss, P.O. Box 17024, Irvine, Calif. 92713

Filed Aug. 17, 1979, Ser. No. 67,285
Int. Cl.³ G06K *7/10, 21/00, 19/06*
U.S. Cl. 235—458 **8 Claims**

1. An improved data card and data card reader combination comprising:

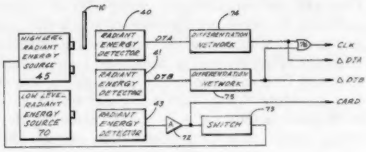
a. a data card incorporating two data tracks, said data tracks surrounding a plurality of perforations spatially arranged to represent encoded data;

b. at least one radiant energy source;

c. at least two radiant energy detectors, including a first radiant energy detector and a second radiant energy detector;

d. guide means for guiding the movement of said data card with respect to said first and said second radiant energy detectors whereby said detectors may produce a first and a second data pulse train corresponding to the perforations of said respective data tracks;

e. first and second differentiation networks for receiving respectively said first and said second data pulse trains whereby said differentiation networks may produce a first and a second differentiated data pulse train;



f. clock generating means for combining said first and said second differentiated data pulse trains whereby a clock pulse train may be produced; and

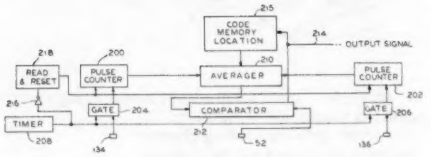
g. a serial to parallel converter receiving said clock pulse train and at least one of said differentiated data pulse trains whereby the coincidence of said clock pulse train and said differentiated data pulse trains may be stored as binary code values.

4,276,470

BAR CODE READER

Bruce A. Rady, Palatine; Thomas R. Wells, Des Plaines, and Kenneth Hendrickson, Chicago, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Continuation-in-part of Ser. No. 808,205, Jun. 20, 1977, abandoned. This application May 21, 1979, Ser. No. 40,778
Int. Cl.³ G06K *7/10, 19/06;* G08C *9/06*
U.S. Cl. 235—463 **31 Claims**



1. A system for reading bar codes on a travelling web by means of a single sensor, each of said bar codes comprising a series of wide and narrow marks separated by spaces, each of said narrow marks and each of said spaces having the same predetermined width, each of said wide marks being twice as wide as each of said narrow marks, whereby the width of a combination of a mark and an adjacent space may be equal to either two or three times said predetermined width, said system comprising:

a. a single stationary sensor means positioned adjacent said travelling web to read and give non-overlapping output signals responsive to each of said marks and spaces as they appear before said sensor responsive to the travelling of said web;

b. means for two-state comparing of the non-overlapping output signals of said sensor responsive to each mark with the non-overlapping output signals of said sensor responsive to at least one space immediately adjacent the sensed mark;

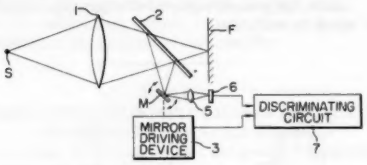
c. means responsive to said comparing of the mark and adjacent space for indicating whether the width of said non-overlapping sensed mark is equal to or wider than said non-overlapping sensed space; and

d. means for signalling the intelligence of the bar code having the sensed marks and spaces responsive to said indicating means.

4,276,471
FOCUS DETECTING DEVICE

Ken Utagawa, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Sep. 18, 1979, Ser. No. 76,550
Claims priority, application Japan, Sep. 20, 1978, 53-114572
Int. Cl.³ G01V *1/20*
U.S. Cl. 250—201 **2 Claims**

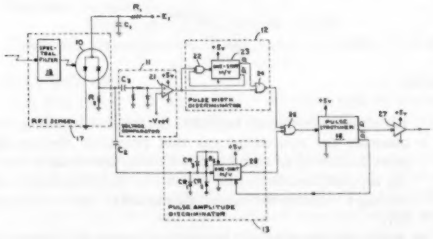


1. A focus detecting device comprising:
an image forming optical system;
a light beam scanning device disposed on the fixed focal plane of said image forming optical system or on a plane conjugate therewith for scanning the light beam from said image forming optical system in a predetermined direction to move the image by said image forming optical system in a direction substantially perpendicular to the optic axis thereof and for generating an electrical output corresponding to the scanning direction of the light beam;
an image re-forming optical system for re-forming the image formed by said image forming optical system;
an image position detecting device disposed on the image forming plane of said image re-forming optical system for photoelectrically detecting the direction of movement of the image formed by said image re-forming lens; and
a discriminating circuit for discriminating between the proper focus, the forward focus and the backward focus from the direction of movement of the image by said image re-forming optical system with respect to the direction of scanning of the light beam by said scanning optical system on the basis of the outputs of said light beam scanning device and said image position detecting device.

4,276,472
DETECTOR FOR Q-SWITCHED LASER RADIATION

Joseph A. Costantino, Morrisville; Jeffrey R. Heberley, East Stroudsburg; Jerry Neimark, Philadelphia, and Thomas E. Weiner, Bensalem, all of Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 15, 1979, Ser. No. 84,704
Int. Cl.³ H01J *40/14*
U.S. Cl. 250—214 B **6 Claims**

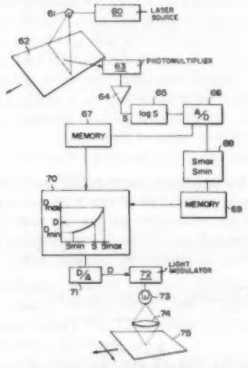


1. Apparatus for detecting radiation from a Q-switched laser, which comprises:
at least one photo-detector for developing a first output signal in response to incident optical radiation;
means, connected to said photo-detector, for comparing said first output signal with a known reference potential thereby to generate a second output signal if said first output signal exceeds reference potential;
a pulse width discriminator, connected to the output of said comparing means, for generating a third output signal if said second output signal has a duration which is less than a predetermined time interval;
a pulse-amplitude discriminator, connected to said comparing means, for generating a fourth output signal if said second output signal exceeds a predetermined amplitude; and
means, responsive to either said third or said fourth output signal, for generating a fifth output signal indicative of optical radiation from a Q-switched laser, said fifth output pulse generating means generating a pulse having a duration substantially greater than the duration of the pulse generated by said comparing means.

4,276,473
GRADATION PROCESSING METHOD AND APPARATUS FOR RADIATION IMAGE RECORDING SYSTEM

Hisatoyo Kato; Masamitsu Ishida, and Seiji Matsumoto, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 26, 1980, Ser. No. 124,770
Claims priority, application Japan, Feb. 28, 1979, 54/23092
Int. Cl.³ G03C *5/16*; G01T *1/11*
U.S. Cl. 250—327.1 **18 Claims**



11. An apparatus for processing the gradation of a radiation image in a radiation image recording system which comprises radiation image read-out means including scanning means for scanning a stimulable phosphor carrying a radiation image stored therein with a stimulating ray, a reading means for reading out the radiation image stored therein by detecting the light emitted from the stimulable phosphor upon stimulation thereof and converting the light to an electric signal having a level corresponding to the amount of the emitted light, a signal processing means for processing the electric signal, a modulating means controlled by the processed electric signal, and a recording means controlled by the modulating means for reproducing on a recording material an image corresponding to the radiation image recorded in the stimulable phosphor,
said signal processing means comprising a signal converting means which converts the electric signal of the minimum level corresponding to the minimum amount of the light emitted from the stimulable phosphor to the level which results in the optical density in the image reproduced on the recording material within the range from the fog

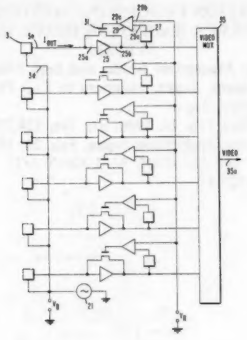
density of the recording material to the fog density plus 0.3 in terms of optical density, converts the electric signal of the maximum level corresponding to the maximum amount of the light emitted from the stimulable phosphor to the level which results in the optical density in the image reproduced on the recording material within the range from 1.5 to 2.8 in terms of optical density, and converts the electric signal of the level between the minimum level and the maximum level to a level which results in the optical density in the image reproduced on the recording material that monotonously increases as the level of the electric signal rises.

4,276,474

INFRARED FOCAL PLANE WITH AUTOMATIC RESPONSIVITY CONTROL USING PHOTODETECTOR BIAS MODULATION

Fred I. Crawford, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 22, 1979, Ser. No. 87,287
Int. Cl.³ G01J *1/00, 1/42*
U.S. Cl. 250—349 **14 Claims**



1. A method for amplitude modulating the output current of a photodetector in proportion to the responsivity of said photodetector, said photodetector generating said output current under the influence of an applied electric field in said photodetector in response to radiation incident upon the detector, comprising:

amplitude modulating said electric field.

4,276,475

NOVEL PHOTOMETRIC SYSTEM

Kenneth E. Nelson, North Attleboro, Mass., assignor to Waters Associates, Inc., Milford, Mass.

Continuation of Ser. No. 734,082, Oct. 20, 1976, abandoned, which is a division of Ser. No. 625,590, Oct. 24, 1975, Pat. No. 4,011,451, which is a continuation-in-part of Ser. No. 592,941, Jul. 3, 1975, abandoned, which is a continuation of Ser. No. 470,076, May 15, 1974, abandoned. This application Apr. 16, 1979, Ser. No. 30,312
Int. Cl.³ G01J *1/42*
U.S. Cl. 250—373 **11 Claims**

1. Apparatus for measuring the amount of light absorbed by a portion of a flowing liquid, comprising:

a sample cell for transporting said flowing liquid along the longitudinal dimension of said cell, said cell including

a wall extending generally longitudinally,

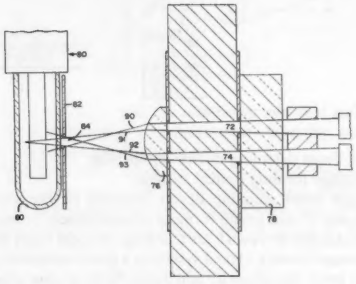
a light entrance window at one longitudinal end of said cell, and

a light exit window at the other longitudinal end of said cell;

a light source for generating a light beam;

masking means including a mask with an aperture positioned between said light source and said entrance window of said cell for optically shaping said beam so that the portion of said beam that enters said cell through said window is transmitted through said cell without contacting said cell wall for a predetermined maximum liquid-lensing condition, thereby assuring that wall contact does not occur under any expected condition,

said maximum condition corresponding to when the liquid in said cell has a distribution of refractive index that causes the greatest expected divergent spreading of said beam by refraction,



detection means positioned beyond said exit window for measuring substantially all of the light emerging from said window, said detection means including a photoelectric element onto which said emerging light beam is incident,

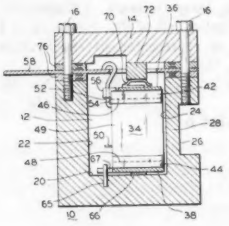
whereby the amount of light detected by said apparatus is independent of the amount by which said beam is bent by refraction within said cell because all of said beam entering said cell and not absorbed by said liquid also emerges from said cell and is detected, thereby making said apparatus independent of variations in the refractive index of said liquid.

4,276,476

RADIATION DETECTOR HAVING A UNITARY FREE FLOATING ELECTRODE ASSEMBLY

Dennis J. Cotic, Milwaukee, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Dec. 20, 1978, Ser. No. 971,200
Int. Cl.³ H01J *39/28*
U.S. Cl. 250—385 **9 Claims**



1. An elongate multicell radiation detector comprising:

a chamber for containing gas that produces electron-ion pairs incidental to absorbing radiation, said chamber having top, bottom, front and rear walls, with the front wall having a window for admitting radiation into said chamber;

an electrode assembly and positioning means for supporting said electrode assembly within said chamber, said positioning means comprising a bottom spacer interposed between said electrode assembly and the bottom of said

chamber, a front spacer interposed between said electrode assembly and the window of said chamber, an upper compressed elastic member interposed between said electrode assembly and the top wall of said chamber, and a rear compressed elastic member interposed between said electrode assembly and the rear wall of said chamber, whereby said electrode assembly is elastically positioned against said front spacer and said bottom spacer in precise relationship to the window of said chamber; and

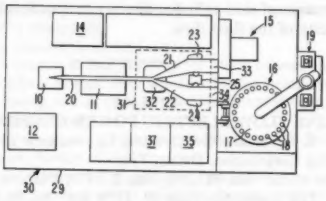
means for establishing electric circuits from said electrode assembly to the exterior of said chamber.

4,276,477

FOCUSING APPARATUS FOR UNIFORM APPLICATION OF CHARGED PARTICLE BEAM

Harald A. Enge, Winchester, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Sep. 17, 1979, Ser. No. 76,011
Int. Cl.³ G01K *1/08*; H21J *3/14*
U.S. Cl. 250—398 **11 Claims**



1. A focusing apparatus for uniform application of a charged particle beam over the exposed surfaces of a plurality of targets comprising:

first deflection means for introducing a variable angle into a charged particle beam;

control means for driving said first deflection means to produce a time modulated fan beam having selected angular limits;

a sector magnet having a time independent magnetic field and arranged in opposition to said first deflection means to produce a gap normal to the plane of said time modulated fan beam for receiving said fan beam and positioned with the edge formed by the intersection of the entrance and exit ends lying adjacent the plane of the original trajectory of said charged particle beam so as to transform said fan beam into a time modulated ribbon beam; and

means for producing relative transverse motion between said targets and said time modulated ribbon beam.

4,276,478

UNIVERSAL FLAT-FILM-CHANGING DEVICE

Sandor Meszaros; Gabriella Kirchner; Janos Balzer, and Karoly Wild, all of Budapest, Hungary, assignors to Medicor Muvek, Budapest, Hungary

Filed Apr. 5, 1979, Ser. No. 27,463
Claims priority, application Hungary, Apr. 11, 1978, ME 2159
Int. Cl.³ G03B *41/16*
U.S. Cl. 250—468 **8 Claims**

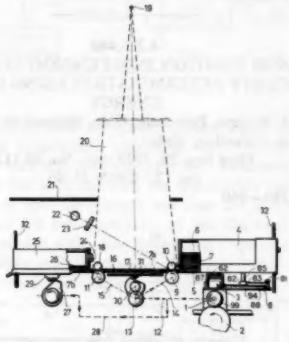
1. A film changer for an apparatus provided with an illumination stage for the exposure of a photosensitive film, comprising:

a storage cassette for unexposed film and a receiving cassette for exposed film removably disposed on opposite sides of said illumination stage, said cassettes having sidewalls respectively provided with coplanar open-ended first and second guide grooves, said storage cassette being provided with a withdrawable closure plate at its bottom;

grooved track means between said cassettes aligned with said guide grooves for defining therewith a planar transport path for a film extracted from said storage cassette and transferred to said receiving cassette after passing through said illumination stage;

feed means adjoining said track means for intermittently advancing a film along said transport path;

separating means underneath said storage cassette synchronized with said feed means and engageable upon withdrawal of said closure plate with a lowermost film of a stack of unexposed films, held by first supporting means in said storage cassette above said first guide grooves, for drawing said lowermost film into said first guide grooves through said bottom and thereupon displacing said lowermost film into engagement with said feed means preparatorily to an exposure thereof in said illumination stage; and



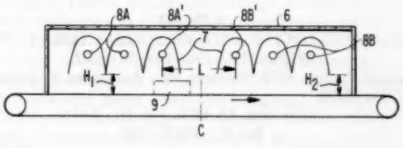
lifting means in said receiving cassette operable by said feed means for elevating said lowermost film, after exposure thereof in said illumination stage and insertion into said second guide grooves, from said second guide grooves into engagement with second supporting means in said receiving cassette, thereby clearing the way for another unexposed film from said storage cassette to be moved along said transport path and transferred after exposure to said receiving cassette.

4,276,479

APPARATUS FOR CURING PHOTO-CURABLE COMPOSITION

Hiroaki Mibu, Kyoto; Tadashi Ishihara, Osaka; Chiaki Tanaka, and Shingo Esaki, both of Kyoto, all of Japan, assignors to Japan Storage Battery Co., Ltd., Kyoto and Nippon Paint Co., Ltd., Osaka, both of, Japan

Division of Ser. No. 943,275, Sep. 18, 1978, Pat. No. 4,182,665, which is a continuation of Ser. No. 777,483, Mar. 14, 1977, abandoned, which is a continuation of Ser. No. 563,991, Apr. 1, 1975, abandoned. This application Aug. 8, 1979, Ser. No. 64,979
Claims priority, application Japan, Apr. 1, 1974, 49-37184; Sep. 25, 1974, 49-110760
Int. Cl.³ B01J *19/00*
U.S. Cl. 250—492 R **13 Claims**



1. An apparatus for curing a photo-curable composition comprising a tunnel type irradiation chamber, a group of light source provided in the forward stage of the chamber for irradiating said composition at an irradiation intensity by the rays

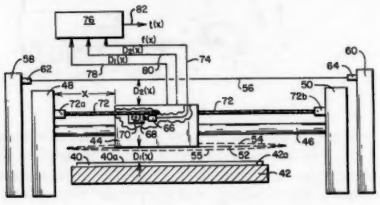
out of which wavelengths shorter than 300 nm are substantially eliminated and which have an abundance of radiation energy in a range of from about 300 to about 460 nm, and a group of light source provided in the afterward stage of the chamber thereby to irradiate the composition by rays having an abundance of radiation energy in wavelengths range of from about 230 to about 460 nm, and wherein a ratio of a maximum irradiation intensity E_c for the wavelengths less than 300 nm from both groups of the light source to a maximum irradiation intensity E_a from the first group of the light source on the surface of the substrate coated with said composition at the A light source region, that is E_c/E_a, is selected to a value not more than 0.1.

4,276,480

SENSOR POSITION INDEPENDENT MATERIAL PROPERTY DETERMINATION USING RADIANT ENERGY

Robert M. Watson, Pataskala, Ohio, assignor to AccuRay Corporation, Columbus, Ohio

Filed Sep. 28, 1979, Ser. No. 80,112
Int. Cl.³ G01N *21/86*
U.S. Cl. 250—560 **49 Claims**



1. A radiant energy method for determining a property of a material that is normally inspected while located generally in a predetermined spatial relation to a first reference position, comprising the steps of

defining a second reference position,

utilizing a sensor means to respond to a condition of the material and to produce a sensor response that can be related to the material property, the relation of the sensor response to the property being susceptible to change with changes in the distance relationship of the sensor means and one of the reference positions or the material,

producing a distance response to changes in the distance from the sensor means to at least one of the reference positions,

producing an initial sensor and distance response-related value or values that can be derived by utilizing the first and second reference positions, and

responding to the distance response, the initial value or values, and the sensor response so as to produce a material property response with substantially decreased susceptibility to change with the changes in the distance relationship of the sensor means and the reference position or the material.

4,276,481

FLUID VELOCITY ACTUATED STRUCTURE FOR A WIND MILL/WATER WHEEL

Denson Parker, 4570 Westport Rd., Apartment 8, Columbus, Ohio 43228

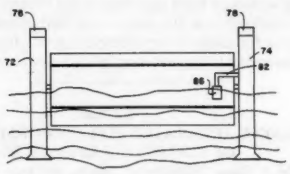
Filed Mar. 12, 1979, Ser. No. 3,614
Int. Cl.³ F03B *7/00*
U.S. Cl. 290—43 **10 Claims**

1. A fluid actuated structure for a wind mill/water wheel comprising:

an elongated cylinder positioned on a rotational shaft a plurality of blades hingedly supported on said cylinder and wherein said blades are curved to follow the contour of said cylinder to assume a position of maximum and minimum resistance to the fluid flow,

said hinge support having a swivel structure to permit resiliency of the cylinder to the fluid flow,

means for altering said cylinder relative to the direction of flow of said fluid,



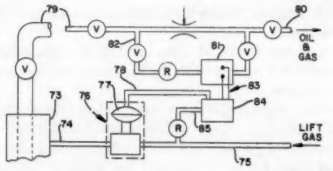
means for converting the rotation of said cylinder, in response to said fluid flow, to useful energy, and means for providing a feedback control to said cylinder to adjust the rotation of said cylinder directly proportional to the velocity of the fluid flow.

4,276,482

LINE FLOW ELECTRIC POWER GENERATOR

Emmet E. Crockett, New Orleans, La., assignor to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 803,214, Jun. 3, 1977, Pat. No. 4,155,022.
This application May 11, 1979, Ser. No. 38,194
Int. Cl.³ H02K *7/18*
U.S. Cl. 290—52 **4 Claims**

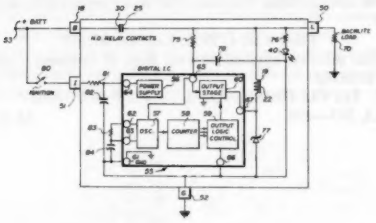


1. Electrical power generating means comprising a tubular member through which a stream of liquid and/or gas may be caused to flow; a helically-vaned rotor member rotably mounted within said tubular member about an axis coincident with the longitudinal axis of said tubular member; means for generating an electromagnetic flux field at least partially within the confines of said tubular member; winding means fixed mounted with respect to said tubular member and at least partially surrounding said flux field; means including said rotor member for providing a cyclically variable reluctance path for said flux field as a function of the rotational position of said rotor with respect to said tubular member; output terminal means connected to said winding means, whereby a cyclically variable voltage potential is developed at said output terminals, upon rotation of said rotor, with voltage magnitude a function of the rotation rate of said rotor member; and in combination with a gas and/or oil well recovery system; said recovery system comprising a well output production flow tube and control valve means through which a source of lift gas is applied to said well to induce output flow from said flow tube; means interconnecting said tubular member with said flow tube to produce a flow rate therethrough as a function of the flow tube output rate; and means connecting the output from said power generating means with said control valve means to control lift gas application to said well as a function of the magnitude of the output from said power generating means.

4,276,483
TIMED ELECTRIC SWITCH

Rodney Hayden, Stoney Creek, Canada, assignor to TRW Inc., Cleveland, Ohio

Filed Dec. 11, 1978, Ser. No. 967,923
Claims priority, application Canada, Apr. 21, 1978, 301690
Int. Cl.³ H01H *43/24*
U.S. Cl. 307—10 R **21 Claims**



1. A timed switch for a window heater in an automotive vehicle which comprises,

a housing mountable in said vehicle,

a pair of contacts in said housing for series connection with said window heater, said window heater being actuated upon closing of said contacts and deactivated upon opening of said contacts,

a timer circuit, means connecting said timer circuit for actuation upon closing of said contacts,

a magnetic solenoid mounted within said housing associated with said contacts, said solenoid being actuated upon closing of said contacts to hold said contacts in a closed condition,

means connecting said timer circuit for controlling current through said solenoid and for altering current flow through said solenoid after a chosen time period of operation of said timer circuit, said alteration of current through said solenoid effecting release of said contacts and interruption of current flow through said window heater,

said timed switch being characterized in that said timer circuit comprises a digital timer circuit mounted within said housing and including an oscillator, counter means sensitive to said oscillator for counting the output of said oscillator and logic means for reading said counter means and for producing a timed output on reading a predetermined count in said counter means, said logic means including means effective upon production of a first output for switching said logic means to a condition to produce a subsequent timed output upon reading of a second count from said counter means which is different from said predetermined count, said timed outputs from said logic means effecting said current alteration in said solenoid.

4,276,484
METHOD AND APPARATUS FOR CONTROLLING CURRENT IN INDUCTIVE LOADS SUCH AS LARGE DIAMETER COILS

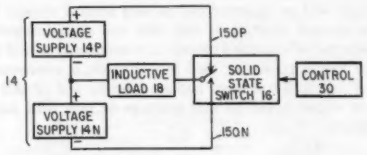
Carlos A. Riveros, 3832 Harrison Ave., Brookfield, Ill. 60513

Filed Sep. 10, 1979, Ser. No. 74,356
Int. Cl.³ G01V *3/10*
U.S. Cl. 307—104 **1 Claim**

1. An electric circuit for controlling current in an inductive load, comprising

a power supply which can supply essential power at a first and a second direct current constant voltage level with low internal impedance,

solid state switching means connected to said power supply and comprising a first solid state switching means and a second solid state switching means, each of which solid state switching means having a switching time that is very much less than the intrinsic time constant of the inductive load, said first solid state switching means being connected in series with said first voltage level of said supply and with said inductive load so as to connect and not connect said first voltage across said load, and said second solid state switching means being connected in series with said second voltage level of said supply and with said load so as to connect and not connect said second voltage supply across said inductive load;

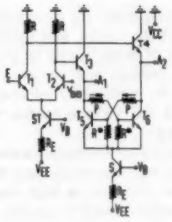


control means for controlling said first and second switching means for sequentially switching them during normal operation such that they are never both switched on at the same time but such that they are sequentially switched in a period of time very much less than the intrinsic time constant of the inductive load, so that the load is effectively presented with a low impedance shunt through said power supply at all times and inductive kick and its resulting problems are avoided.

4,276,485
MONOLITHIC DIGITAL SEMICONDUCTOR CIRCUIT COMPRISING A PLURALITY OF BIPOLAR TRANSISTORS

Peter Rydval, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 3, 1978, Ser. No. 957,458
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1977, 2751881
Int. Cl.³ H03K *19/013, 19/20*
U.S. Cl. 307—463 **2 Claims**



1. In a monolithic integrated semiconductor circuit with a differential amplifier, said differential amplifier being formed by first and second bipolar transistors having their respective emitters connected together, a current supply bipolar transistor having its emitter connectable through a resistor to a first potential and having its collector connected to said emitters of said two bipolar transistors of said differential amplifier, the base of said current supply transistor being connectable to a second potential source, the collectors of said differential amplifier transistors being connectable through resistors to a reference potential, the base of a first one of said differential amplifier transistors being connected to an input terminal of said amplifier, a logic linking stage including third and fourth transistors whose collectors respectively are each connectable to said reference potential and whose bases are respectively connected to said collectors of said first and second transistors, a bistable flip-flop including fifth and sixth bipolar transistors

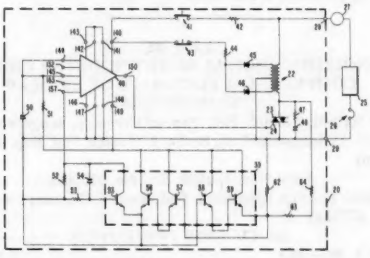
each with an emitter connected to a collector terminal of a current supply means, a collector of said fifth transistor is connected to an emitter of said third transistor and a collector of said sixth transistor is connected to an emitter of said fourth transistor, an improvement comprising first and second resistors connected together at a first node and third and fourth resistors connected together at a second node, an opposite end of said first resistor is connected to said emitter of said third transistor, said first node is connected to a base of said sixth transistor and an opposite end of said second resistor is connected to said emitters of said fifth and sixth transistors, an opposite end of said third transistor is connected to said emitter of said fourth transistor, said second node is connected to a base of said fifth transistor and an opposite end of said fourth resistor is connected to said emitters of said fifth and sixth transistors.

4,276,486

TWO TERMINAL POWER CONTROL SWITCH WITH TRIAC CURRENT POWERED CONTROL MEANS

Arjan D. Ahuja, Torrance, and James E. Brewer, Anaheim, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 16, 1979, Ser. No. 12,682
Int. Cl.³ H03K *17/60*
U.S. Cl. 307—252 B **6 Claims**



5. A switching arrangement for electrically interconnecting a load to an AC voltage source, said switching arrangement having the capability of being turned on and off by circuits of said switching arrangement, and the additional capability of being turned off by the momentary interrupting the AC voltage supplied by said AC voltage source, said switching arrangement comprising:

a triac for providing a low impedance electrical path therethrough in response to the application of triggering signals thereto, and for providing a high impedance electrical path in the absence of said triggering signals, said triac being connected in an electrical path between said load and said AC voltage source;

control circuit means for applying triggering signals to said triac when enabling power is applied thereto;

first switch means including a normally open switch for supplying enabling power derived from AC voltage source to said control circuit means when said normally open switch is closed, and whereupon momentary closure of said normally open switch turns on said switching arrangement; and

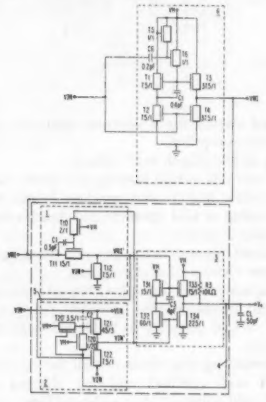
second switch means, including a normally closed switch and transformer having a primary winding thereof connected in series with said load and said AC voltage source, and having a secondary winding thereof coupled to said normally closed switch, for supplying enabling power derived from current which flows through said triac to said control circuit means when said normally closed switch is closed, and whereupon momentary opening of said normally closed switch or upon the momentary interruption of the AC voltage supplied to said switching arrangement turns off said switching arrangement.

4,276,487

FET DRIVER CIRCUIT WITH SHORT SWITCHING TIMES

Luis M. Arzubi; Rainer Clemen, both of Boeblingen, and Jörg Gschwendtner, Esslingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 4, 1979, Ser. No. 27,128
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1978, 2816980
Int. Cl.³ H03K *17/04, 17/284, 17/687, 19/017*
U.S. Cl. 307—270 **13 Claims**



1. A driver circuit including a plurality of field effect transistors, each having a gate and first and second current conducting electrodes, said driver circuit including a transmission stage and a delay stage responsive to two out-of-phase input signals and having their outputs coupled to the inputs of a bootstrap push-pull output stage to provide an output signal on a driver circuit output node, the delay stage including a load transistor and a driver transistor having a first one of their current conducting electrodes connected to provide a delay stage output node, the improvement comprising:

means for coupling one of said out-of-phase input signals to the second current conducting electrode of said load transistor;

feedback means connecting said circuit output node to the gate of said load transistor; and

means for connecting the output of said transmission stage to the gate of said driver transistor.

4,276,488

MULTI-MASTER SINGLE-SLAVE ECL FLIP-FLOP

Douglas M. Benedict, Santa Monica, and James R. Gaskill, Jr., Pacific Palisades, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 13, 1978, Ser. No. 960,262
Int. Cl.³ H03K *3/289, 19/086*
U.S. Cl. 307—272 A **14 Claims**

1. A multi-master single-slave flip-flop comprising:

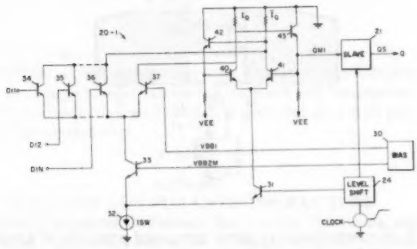
a plurality of master flip-flops, each of said master flip-flops having a plurality of data inputs, a clock input and two outputs, each of said master flip-flops comprising a two-level cascode circuit of the emitter coupled logic type including a lower current switch coupled to two upper current switches and a latch circuit;

a slave flip-flop having a plurality of data inputs, a clock

input and two outputs, said slave flip-flop comprising an internal input gating circuit and a two-level cascode circuit of the emitter coupled logic type including a lower current switch coupled to two upper current switches and a latch circuit;

one output of each of said master flip-flops being connected to a data input of said slave flip-flop, the outputs of each of said master flip-flops being discretionarily connected to the inputs of said master flip-flops, said slave flip-flop outputs being discretionarily connected to the data inputs of said master flip-flops and said slave flip-flop;

said one output of each of said master flip-flops being selected such that with given data signals the combination of said master flip-flops and said input gating circuit of said



slave flip-flop applies a logic-one level signal to the cascode circuit of said slave flip-flop at any given time; and

a clock coupled to the clock inputs of said master flip-flops and said slave flip-flop for providing clock signals thereto;

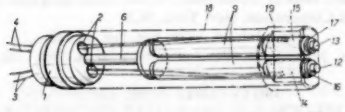
said master flip-flops and said slave flip-flop being substantially identical circuits differing in that the bias voltage applied to the lower current switches of said master flip-flops is approximately 100 millivolts lower than the bais voltage applied to the lower current switch of said slave flip-flop, and in that said clock signals are applied to opposite sides of the lower current switches of said slave flip-flop and said master flip-flops to provide master flip-flop, then slave flip-flop release timing at positive clock signal edges, and then slave flip-flop lock-up, then master flip-flop release at negative clock signal edges.

4,276,489

MULTIPLE COIL ELECTROMAGNETIC PICKUP

Sylvain M. Dron, Buc, and Gerard M. G. Evrard, Livry Gargan, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Continuation of Ser. No. 843,542, Oct. 19, 1977, abandoned. This application Jul. 18, 1979, Ser. No. 58,489
Claims priority, application France, Oct. 26, 1976, 76 32673
Int. Cl.³ H02K *21/38*
U.S. Cl. 310—155 **1 Claim**



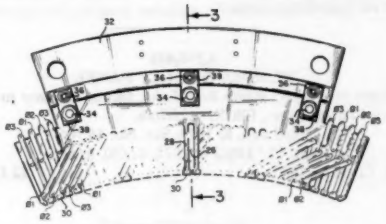
1. An electromagnetic sensor comprising at least a pair of coils, each coil being part of an assembly comprising an axial arrangement of a coil and a straight magnet arranged end to end, said assemblies being parallel to each other, the magnet poles of the same polarity extending in the same direction, only the coil of each assembly being housed in a solid piece of a magnetic material, each magnet being in an essentially tubular non-magnetic housing.

4,276,490

BRUSHLESS DC MOTOR WITH RARE-EARTH MAGNET ROTOR AND SEGMENTED STATOR

Neil N. Saldinger, Woodland Hills, Calif., assignor to Vernitron Corporation, Long Island City, N.Y.

Continuation-in-part of Ser. No. 861,117, Dec. 16, 1977, abandoned. This application Aug. 27, 1979, Ser. No. 69,714
Int. Cl.³ H02K *19/26, 1/18*
U.S. Cl. 310—184 **4 Claims**



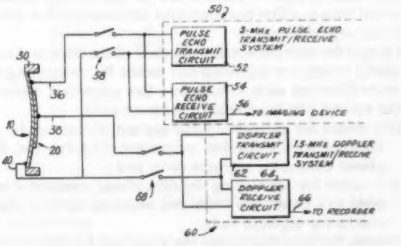
1. A segmented multiphase stator in a motor having a permanent magnet rotor, each segment being comprised of a comb-like arcuate core having inwardly extending teeth over its entire arcuate length, and a support structure across the back of said core over less than its entire arcuate length to leave a portion of said core at each end thereof with teeth extending therefrom to provide a plurality of slots through which phase windings may be wound over the unsupported back of said core, said multiphase stator having each of successive phase windings started in successive slots between teeth in a symmetrical repetitive sequential order over the full length of said core, with each phase winding crossing over a plurality of teeth equal to the number of teeth at each end extending from said unsupported back of said core, and turns of successive phase windings wound in slots at each end of said core with one winding in each slot being completed over the unsupported back thereof, whereby teeth at each unsupported back of said core is provided with flux from successive phase windings equal to flux through teeth in the central supported portion of said comb-like core, thereby to complete the symmetry to the ends for a stator having the same number of phase windings for all teeth of said comb-like core for a more uniform field strength at the pole faces of the teeth at the ends thereof.

4,276,491

FOCUSING PIEZOELECTRIC ULTRASONIC MEDICAL DIAGNOSTIC SYSTEM

Keith P. Daniel, Gordon, Australia, assignor to Ausonics Pty. Limited, Lane Cov., Australia

Filed Oct. 2, 1979, Ser. No. 81,272
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—317 **5 Claims**



1. An ultrasonic medical diagnostic system comprising a first transducer element; a second transducer element; electrodes

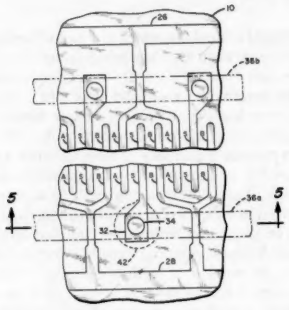
coating the front and back surfaces of both of said transducer elements, with the back electrode of said first transducer element and the front electrode of said second transducer element being bonded together; means for controlling pulse echo operation at one frequency, with relatively low penetration and high resolution, by applying an energizing signal across the front and back electrodes of one of said transducer elements; and means for controlling Doppler operation at another lower frequency, with relatively high penetration and low resolution, by applying an energizing signal across the front electrode of said first transducer element and the back electrode of said second transducer element.

4,276,492

PLASMA DISPLAY PANEL

William N. Mayer, White Bear Lake, Minn., assignor to Modern Controls, Inc., Elk River, Minn.

Filed Jun. 8, 1979, Ser. No. 46,706
Int. Cl.³ H01J *61/073, 61/30, 61/36*
U.S. Cl. 313—188 **12 Claims**



1. In an AC plasma shift display panel of the type having parallel planar conductor segments transversely oriented to a plurality of gas channels wherein dielectric separation exists between the planar conductor segments and gas channels, and wherein every third planar conductor segment is electrically driven by a common voltage excitation source A, B or S, the improvement in connecting said planar conductor segments to said voltage sources comprising:

(a) a plurality of parallel and spaced bus connectors extending orthogonal to said planar conductor segments, one bus connector at the same planar level and one bus connector at a different planar level than said planar conductor segments at spaced intervals adjacent respective first and second ends of said planar conductor segments;

(b) means for connecting said planar conductor segments to said bus connectors in repeatable patterns of six, comprising

(i) means for interconnecting the ends of the first and fourth planar conductor segments and means for connecting the interconnected ends to a first bus connector adjacent the first planar conductor segment ends;

(ii) means for interconnecting the ends of the third and sixth planar conductor segments and means for connecting the interconnected ends to a second bus connector adjacent the second planar conductor segment ends;

(iii) means for connecting the second planar conductor segment to a third bus connector adjacent the first planar conductor segment ends; and

(iv) means for connecting the fifth planar conductor segment to a fourth bus connector adjacent the first planar conductor segment ends;

(c) means for interconnecting the third and fourth bus connectors and for connecting same to a voltage excitation source S; and

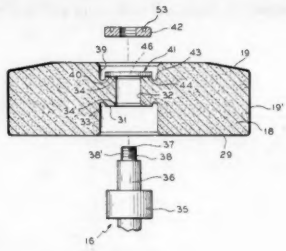
(d) means for connecting the first bus connector to a voltage excitation source A and for connecting the second bus connector to a voltage excitation source B.

4,276,493

ATTACHMENT MEANS FOR A GRAPHITE X-RAY TUBE TARGET

Saroja R. Srinivasa, Milwaukee; Peter S. Shelley, Brookfield, and Robert E. Hueschen, Hales Corners, all of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 10, 1979, Ser. No. 73,757
Int. Cl.³ H01J *35/08*
U.S. Cl. 313—330 **15 Claims**



1. A composite x-ray target composed primarily of graphite adapted for being attached to the rotor stem of a rotating anode x-ray tube,

said target comprising a disk-shaped graphite body having a central axial bore and axially spaced apart radially extending first and second shoulders formed in said body around respectively opposite ends of said bore,

metal washer means having opposed faces, one of which faces is brazed to said first shoulder, said washer means having slot means,

said stem being insertable in said body and comprising a cylindrical portion for extending through said bore of said body and a first shoulder on said portion to abut against said one face of the washer and having a threaded end portion for extending through said slot means said threaded end portion having a cross sectional shape other than a full circle and being shaped complementarily to said slot means for effecting a positive driving relationship therewith, said stem also having a second radially extending shoulder axially spaced from said first shoulder for abutting against said second shoulder of said body, and

a nut member for turning onto said threaded end of the stem and against said washer means for clamping said target compressively to said stem.

4,276,494

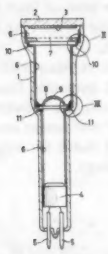
CATHODE RAY TUBE WITH TRANSVERSELY SUPPORTED ELECTRODE AND CONDUCTIVE WALL COATING

Johannes H. T. van Roosmalen, and Gerardus A. H. M. Vrijssen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 11, 1979, Ser. No. 56,480
Claims priority, application Netherlands, Jul. 20, 1979, 7807758
Int. Cl.³ H01J *29/02, 29/88*
U.S. Cl. 313—479 **5 Claims**

1. A cathode-ray tube comprising a tubular envelope portion of insulating material having an internally provided electrically conductive wall coating and at least one electrode extending transversely to the wall coating, said electrode being supported in the envelope by a supporting surface extending transversely to the longitudinal axis of the envelope portion, said supporting surface being formed by a substantially stepwise reduction of the inside transverse dimensions of the enve-

lope portion, characterized in that the conductive wall coating is interrupted in the proximity of the electrode extending transversely to the wall coating, and the stepwise reduction is in the form of at least a first and a second step, in which, measured in



the direction of decreasing transverse dimension, the first step forms the supporting surface for the electrode and the interruption in the conductive wall coating is provided on a wall portion of the second step.

4,276,495

ELECTRON GUN FOR CATHODE-RAY TUBE

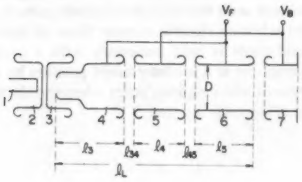
Masakazu Fukushima, Kokubunji; Kunio Ando, Yokohama, and Kenichi Fukuzawa, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 2, 1978, Ser. No. 911,804

Claims priority, application Japan, Jun. 15, 1977, 52/69841

Int. Cl.³ H01J *29/46, 29/56*

U.S. Cl. 315—16 **4 Claims**



1. An electron gun for cathode-ray tube comprising a lens system for focusing electron beams emitted from a cathode, wherein said lens system includes first, second, third and fourth cylindrical electrodes having substantially the same inner diameter and arranged in this order from the side of said cathode, the length of said third electrode is selected to be larger than a half of the inner diameter of said third electrode, and said first and third electrodes are applied with the same voltage while said second and fourth electrodes are applied with a voltage supplied to a phosphor screen electrode so that a bipotential lens is formed by said first and second electrodes and a unipotential lens is formed by said second, third and fourth electrodes.

4,276,496

GAS DISCHARGE LAMP EMPLOYING A PULSE GENERATOR WITH A DOUBLE STAGE AMPLIFICATION CIRCUIT

Guido Arena-Ochoa, Colina de la Ilusion #49, Fraccionamiento Bulevares, Estado de Mexico, Mexico

Continuation-in-part of Ser. No. 914,996, Jun. 13, 1978, abandoned. This application Jul. 18, 1979, Ser. No. 58,672

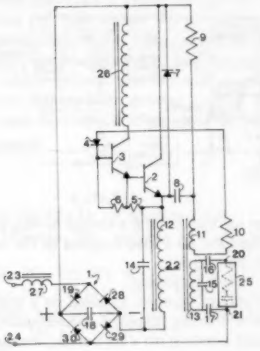
Int. Cl.³ H05B *37/00, 39/00, 41/14*

U.S. Cl. 315—206 **6 Claims**

1. A negative feedback DC-AC inverter for powering a gaseous discharge lamp which has open-circuit portection by frequency and comprises:

a non-saturating core transformer having a primary winding, a first secondary winding and a second secondary winding;

a first and a second transistor connected as a Darlington pair, the collector of said first transistor being connected to a terminal of a DC power source through a high inductance choke coil, the collector of said second transistor being directly connected to said terminal of the DC power source, the emitter of said second transistor being connected to an opposite terminal of said DC power source through said primary winding of said transformer;



a negative feedback circuit which comprises said second secondary winding, a resistor, a diode, a base-emitter junction of said first and second transistor Darlington pair and a capacitor;

a bias resistor connected between said DC power terminal and a junction point of said second secondary winding of said transformer and said capacitor in said feedback circuit to provide biasing potential to said base of said first transistor for conductivity;

said first secondary winding of said transformer in open circuit is shunted by a very small capacitor whereby the inverter frequency is increased considerably.

4,276,497

LASER FLASHTUBE POWER SUPPLY

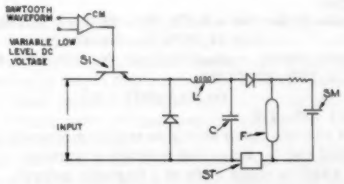
Ronald N. Burbeck, and Michael R. Keightley, both of Rugby, England, assignors to J. K. Lasers Limited, Rugby, England

Filed Apr. 26, 1979, Ser. No. 33,399

Claims priority, application United Kingdom, Apr. 28, 1978, 16879/78

Int. Cl.³ H05B *41/34*

U.S. Cl. 315—209 R **8 Claims**



1. Power supply means for pulsed operation of a laser flash tube, comprising:

high frequency switch means for providing a high frequency pulse train output;

means for controlling said high frequency switch means to modulate the duty cycle of said pulse train output; and

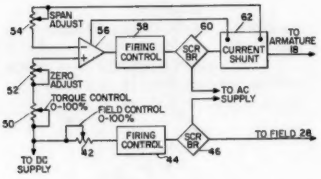
a filter for substantially removing the high frequency components from said pulse train output.

4,276,498

ADJUSTABLE TORQUE CONTROL WINCH SYSTEM

Robert F. Stager, and Graham J. Blight, both of Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.

Filed Dec. 9, 1977, Ser. No. 858,962
Int. Cl.³ B65H *77/00*; H02P *7/06*
U.S. Cl. 318—6 **6 Claims**



1. System for maintaining a torque having a constant amplitude and direction on a load coupled to the reel of a winding mechanism, comprising:

A. a d.c. motor including:

i. an armature winding disposed on a shaft, and

ii. a field winding disposed concentrically about said armature winding on a supporting member, and adapted for electromagnetic interaction with said armature winding,

B. means for rotatably journaling said supporting member with respect to said shaft,

C. means for coupling said supporting member and said reel so that the angular velocity of said reel about its rotational axis is proportional to the angular velocity of said supporting member about said shaft axis,

D. means for rotating said shaft about its axis at a predetermined angular velocity, and

E. torque control means for driving a first selected constant current through said field winding and a second selected constant current through said armature winding for maintaining said constant amplitude and direction torque on said load independent of the rotational speed magnitude and direction of said supporting member,

whereby said reel is driven by said supporting member to rotate about said reel axis at an angular velocity required to maintain said constant torque on said load.

4,276,499

ROTARY ACTUATOR

Noboru Masuda, and Masakazu Sugimoto, both of Tokyo, Japan, assignors to Denki Onkyo Company, Limited, Tokyo, Japan

Division of Ser. No. 856,176, Nov. 30, 1977. This application May 29, 1979, Ser. No. 43,226
Claims priority, application Japan, Nov. 30, 1976, 51-144474; Dec. 21, 1976, 51-171307
Int. Cl.³ H02P *1/02*
U.S. Cl. 318—119 **14 Claims**

1. A rotary actuator having an angular movement in a predetermined angular range said actuator comprising:

(a) a hollow stator made of a magnetic material,

(b) a plurality of main magnetic poles inside said stator,

(c) a plurality of drive coils wound on each of said main magnetic poles and adapted to magnetize said main magnetic poles,

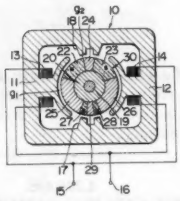
(d) a magnetic rotor positioned in the space surrounded by said main magnetic poles having magnetized zones with alternatingly different polarities and non-magnetized zones arranged therebetween in the circumferential direction, wherein the rotor has an angular movement in accordance with the electric current flowing in said drive coils,

(e) a rotation shaft, of a non-magnetic material, for supporting said rotor,

(f) a magnetic flux generating means provided on one end of said shaft, having an area of high magnetic flux density, said flux generating means moving in accordance with the rotation of said shaft,

(g) at least one magnetic resistance effect element positioned with respect to said magnetic flux generating means in order to detect the angular movement of said shaft and convert said angular movement into an electric signal,

(h) means fixed to said stator for supporting said magnetic resistance effect element,



(i) means for supplying electric power to said magnetic resistance effect element,

(j) detecting means for detecting out an output voltage as a function of the rotation of said magnetic resistance effect element when said shaft rotates together with said magnetic rotor, and

(k) means for energising said drive coils such that said magnetic rotor rotates in a predetermined circumferential direction and within a predetermined angular range in accordance with the direction and magnitude of electric current when an electric current flows in said drive coils and said rotor is held stationary with a predetermined control torque at a predetermined position by the attracting force of said magnetic poles when the electric current in said drive coils is zero.

4,276,500

BRAKING SYSTEM

Elmer H. Sumka, Edison, and Henry J. Shea, Dover, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 28, 1979, Ser. No. 24,767
Int. Cl.³ H02K *17/32*
U.S. Cl. 318—369 **6 Claims**

1. A braking system for transportation apparatus, comprising:

an inclined conveyor for transporting passengers between first and second landings,

a source of electrical energy,

electrical drive means for said conveyor,

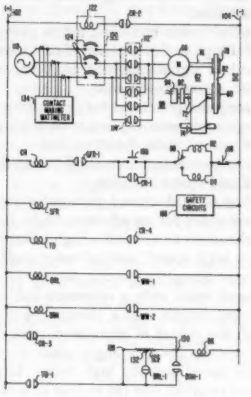
contactor means connecting said electrical drive means to said source of electrical energy,

electrical measuring means providing a control signal responsive to a predetermined electrical parameter of said electrical drive means, with said parameter being related to the electrical energy being used by said electrical drive means to transport passengers between the landings,

braking means for stopping said conveyor,

and adjustment means for adjusting the braking effort of said

braking means in response to said control signal, such that the braking effort is inversely proportional to the effort



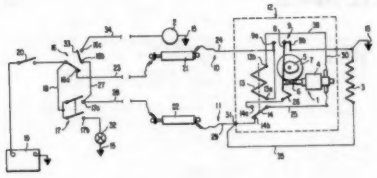
being expended by said drive means at the time said braking means is operated to stop the conveyor.

4,276,501

DEVICE FOR CLEANING AND DEFOGGING, ESPECIALLY FOR THE REAR WINDOW OF AN AUTOMOBILE

Helmut Fanz, Asnieres, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Nov. 21, 1977, Ser. No. 853,741
Claims priority, application France, Nov. 19, 1976, 76 35036
Int. Cl.[3] H02P *3/00*
U.S. Cl. 318—470 **10 Claims**



1. A window-clearing arrangement particularly for the rear window mounted on a vehicle liftgate attached to a body of a vehicle, which comprises:

a wiper motor-reducer assembly, said assembly including a motor, said assembly being located on said vehicle liftgate;

an electric heater window-defogger system, said defogger system being located on said vehicle liftgate;

means for supplying electrical power to said wiper motor-reducer and to said defogger system, said means being located on the body of said vehicle;

first and second conductor means and a vehicle ground coupling said means for supplying electrical power with said wiper motor-reducer assembly, said defogger system being coupled to said second conductor means;

electric circuit means coupling said wiper motor-reducer assembly to said first and said second conductor means, said circuit means including a relay having a movable relay arm, said motor being coupled between said relay arm and said vehicle ground, said circuit means further including a reversing switch having a movable reversing switch contact coupled to a fixed contact of said relay; and

means for prolonging the operation of said motor until said motor is stopped in its rest position, said prolonging means including a mechanical means coupling the mechanical output of said motor to said movable reversing switch contact for controlling the position of said reversing switch contact;

wherein said motor is selectively coupled to one of said first and said second conductor means by said relay and said reversing switch during the operation of said motor;

wherein said motor is short-circuited by said relay and said reversing switch when said motor is stopped in its rest position; and

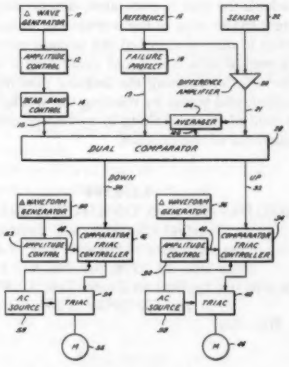
wherein the complete electrical powering and control for completely and independently controlling wiping by said wiper motor-reducer assembly and defogging by said defogger system are realized solely through the electrical interconnection of said means for supplying electric power with said wiper motor-reducer assembly and said defogger system by said first and second conductor means and by said vehicle ground, said first and second conductor means and said vehicle ground passing through a junction between said vehicle liftgate and the body of said vehicle.

4,276,502

SOLID STATE CONTROLLER

Harry S. Elliott, Houston, Tex., assignor to Varco, Inc., Houston, Tex.

Division of Ser. No. 727,001, Sep. 27, 1976, which is a continuation of Ser. No. 495,142, Aug. 6, 1974, abandoned. This application Apr. 28, 1978, Ser. No. 900,926
Int. Cl.[3] G05B *23/02*
U.S. Cl. 318—565 **3 Claims**



1. A control system for controlling a process variable to a set point by manipulating a valve by an actuator and having the set point, process variable, and valve position as inputs, comprising:

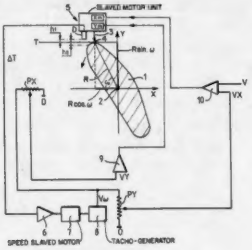
a controller having at least one adjustable mode of control, and including means for adjusting said mode of control, and having the set point and the process variable as inputs and having an output responsive to the difference between the set point and the process variable by said mode of control, each value of said output corresponding to a position of the valve;

solid state relay means for positioning the valve to the position required by said output of said controller by control of the power to the actuator, and having said output and the valve position as inputs, said relay means including time proportioning means for regulating the rate of travel of the valve during fixed time periods by diminishing the duration of power applied to the actuator during said fixed time periods as the valve position approaches the position required by said output.

4,276,503
METHOD AND APPARATUS FOR SERVO-CONTROLLING A ROTATING WORKPIECE

Jean Peiffert, 42 Allee de Persepolis, Orsay, Essonne, and Roger S. Barbedienne, 11, rue de Neuville, Eragny sur Oise, Val d'Oise, both of France

Filed Sep. 20, 1978, Ser. No. 944,221
Claims priority, application France, Sep. 20, 1977, 77 28333
Int. Cl.[3] G05B *19/36*
U.S. Cl. 318—576 3 Claims

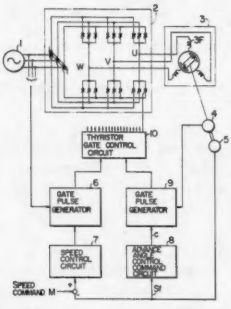


1. A method of servo-controlling a rotating workpiece in relation to a member such as a tool, capable of translational motion along a system of two mutually perpendicular axes, as a function of a desired rate of transit of the periphery of said workpiece past said tool, including the steps of disposing the rotation axis of the workpiece at the centre of the system of axes to which the tool is associated; determining the direction of a tangent to the edge of the workpiece; slaving control over the rotation to displacement of the tangent parallel with itself; detecting such displacement and generating a signal representative thereof; determining the angular position of the workpiece; nulling said signal by rotating the workpiece; and varying the speed of the tool along its system of axes as a function of displacement of the tangent.

4,276,504
CONTROL DEVICE FOR COMMUTATORLESS MOTOR

Hiroshi Nagase; Toshiaki Okuyama, and Yuzuru Kubota, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 20, 1978, Ser. No. 971,270
Claims priority, application Japan, Feb. 3, 1978, 53-10466
Int. Cl.[3] H02P *7/28*
U.S. Cl. 318—721 7 Claims



1. An advance angle control apparatus for a commutatorless motor, comprising

frequency converter means including a plurality of thyristors for converting a frequency in order to supply an AC power to armature windings of a synchronous motor,

a position detector for detecting the position of the rotor of said synchronous motor,

a speed detector for detecting an actual speed of said synchronous motor,

a speed control means including a first gate pulse generator for controlling the firing phase of said thyristors in accordance with a signal obtained by comparing the actual speed with a command speed,

a second gate pulse generator for generating signals controlling the gates of said thyristors in accordance with the output of said position detector, and

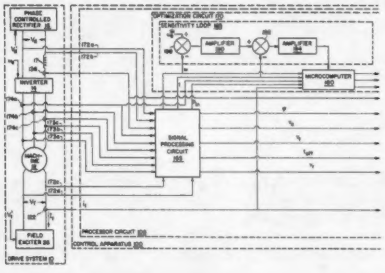
an advance angle control command circuit applied with the output of said speed detector,

for outputting to said second gate pulse generator a signal with a low value for an advance angle at a low speed of said synchronous motor and a high value for the advance angle at a high speed, said advance angle control command circuit comprising a comparator for comparing the actual speed value with a reference value provided by a speed setting circuit, and a change regulating circuit applied with the output of said comparator for regulating a change between advance angle control command signals at the low speed and the high speed during a predetermined time interval, and the output of which is applied to said second gate pulse generator as the advance angle control command signals, said comparator switching its output signal from a constant value to another constant value when the actual speed value reaches a predetermined speed value.

4,276,505
MICROCOMPUTER-BASED CONTROL APPARATUS FOR A LOAD-COMMUTATED INVERTER SYNCHRONOUS MACHINE DRIVE SYSTEM

Bimal K. Bose, Latham, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 31, 1980, Ser. No. 135,215
Int. Cl.[3] H02P *5/28, 5/34, 7/36*
U.S. Cl. 318—723 20 Claims



1. For use with a load commutated inverter-synchronous machine drive system comprised of a synchronous-machine, a first source of variable amplitude direct current voltage coupled to said synchronous machine for supplying said synchronous machine with field voltage, a second source of variable amplitude direct current voltage, and an inverter coupled between said second source of variable amplitude direct current voltage and said synchronous machine for supplying said synchronous machine with variable amplitude, variable frequency, alternating current, an improved control apparatus for regulating inverter frequency to minimize synchronous machine reactive power and for regulating the voltage supplied by said first and said second sources of variable amplitude direct current voltage to maximize synchronous machine efficiency, said control apparatus comprising:

first means coupled to said synchronous machine and to said first source of variable amplitude direct current voltage, said first means determining optimum synchronous ma-

chine air gap flux from actual machine drive system voltages and currents and adjusting the voltage supplied by said first source of variable amplitude direct current voltage responsive to the difference in magnitude between said optimum synchronous machine air gap flux and actual synchronous machine air gap flux;

second means coupled to said synchronous machine and to said second source of variable amplitude direct current voltage, said second means determining optimum inverter link current from machine drive system voltages and currents and adjusting the voltage supplied by said second source of variable amplitude direct current voltage responsive to the difference in magnitude between said optimum inverter link current and actual inverter link current; and

third means coupled to said synchronous machine and said inverter, said third means determining the optimum inverter turn-off time from machine drive system voltages and adjusting inverter frequency responsive to the difference in magnitude between optimum inverter turn-off time and actual inverter turn-off time thereby minimizing synchronous machine reactive power.

4,276,506

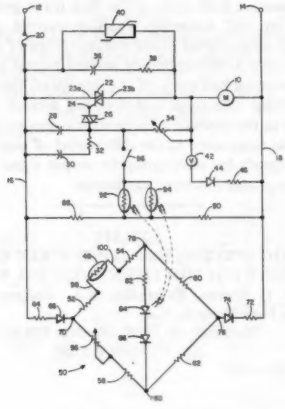
MOTOR CONTROL CIRCUIT

Hercel A. Little, Hampton, Minn., assignor to Chore-Time Equipment, Inc., Milford, Ind.

Filed Jun. 29, 1979, Ser. No. 53,330

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—806 **17 Claims**



1. A motor control circuit for controlling speed of an AC electric motor as a function of a sensed parameter, the motor control circuit comprising:

first and second conductor means adapted to be connected to a source of AC voltage;

integrating circuit means connected between the first and second conductor means and having an output;

first gated bilateral switch means having first and second main current carrying electrodes and a gate electrode for receiving a signal derived from the output of integrating circuit means, the first and second main current carrying electrodes being connected in series with the AC electric motor between the first and second conductor means;

condition responsive sensing circuit means for providing a signal which is a function of the sensed parameter;

light emitting means for emitting light as a function of the signal from the condition responsive means; and

light responsive charging circuit means for providing charging current to the integrating circuit means as a function of light received from the light emitting means, the light responsive charging circuit comprising:

voltage divider means connected between the first and second conductor means; and

photosensor means connected between the voltage divider means and the integrating circuit means.

4,276,507

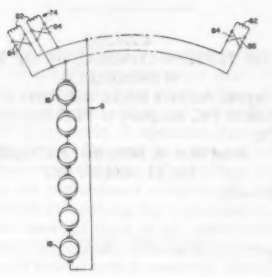
HOMOPOLAR MACHINE FOR REVERSIBLE ENERGY STORAGE AND TRANSFER SYSTEMS

Roy E. Stillwagon, Ruffsdale, Pa., assignor to U.S. Department of Energy, Washington, D.C.

Division of Ser. No. 585,642, Jun. 10, 1975, Pat. No. 4,110,648. This application Feb. 3, 1978, Ser. No. 874,978

Int. Cl.² H02K *7/02*

U.S. Cl. 322—48 **5 Claims**



1. The method of reversibly storing and transferring energy between a homopolar machine and a connected inductive load comprising the steps of:

storing energy in a rotor of a homopolar machine by rotating the rotor at 100% speed and providing 100% voltage at the rotor terminals;

closing a series switch to transfer a current pulse from the rotor to said connected inductive load;

permitting the current to rise in said load to its peak value in time T_c and simultaneously allowing the machine voltage and speed to decrease to zero;

closing a shunt switch across the inductive load to maintain the current therein at said peak value and thereby store the energy magnetically in said inductive load for a time T_b;

at the end of time T_b, opening said shunt switch and transferring current from said inductive load to the machine during a time T_q to simultaneously permit the transferring current to fall to zero and cause said machine rotor to accelerate substantially to 100% speed and 100% voltage;

opening said series switch; and

maintaining said rotor speed and voltage for a time T_f until the series switch is again closed to repeat the cycle.

4,276,508

ELECTRONIC ATTENUATOR APPARATUS

Kikuo Usugi, Toda, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1979, Ser. No. 31,491

Claims priority, application Japan, Apr. 24, 1978, 53-54439[U]

Int. Cl.³ H01P *1/22*

U.S. Cl. 323—354 **15 Claims**

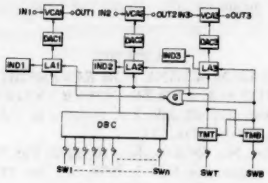
1. An electronic attenuator apparatus comprising:

a plurality of voltage controlled attenuator circuits each varying an attenuation factor between an input and an output in response to the level of a voltage supplied thereto;

a plurality of hold circuits each connected to a corresponding said attenuator circuit for holding said voltage and for

supplying it to said attenuator circuit to control said attenuation factor;

a level setting circuit for manually setting a level signal indicating said level of the voltage; and



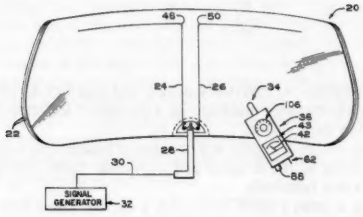
control means for selectively supplying said level signal from said level setting circuit to one of said hold circuits.

4,276,509

PROBE FOR TESTING CONDUCTOR OF AN ANTENNA WINDSHIELD

Lovell D. Bryant, McKees Rocks, and Harry S. Koontz, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 8, 1979, Ser. No. 18,685
Int. Cl.[3] G01R *31/02*
U.S. Cl. 324—51 **6 Claims**



1. Method of determining the presence or absence of a fault in the antenna wire of an antenna windshield wherein the antenna system is of the type having at least one wire between a pair of laminated glass sheets and having a segment of the wire connected to means for providing external electrical access to the at least one wire, comprising the step of:

connecting the means for providing electrical access to a radio frequency generator; and

moving a frequency pick up probe relative to the at least one wire wherein reception of a radio frequency signal by the probe indicates electrical continuity from the generating means to the probe location and no reception of a radio frequency signal by the probe indicates no electrical continuity from the generating means to the probe location.

4,276,510

APPARATUS FOR SENSING CURRENT TRANSFORMER PRIMARY CURRENT AS A FUNCTION OF DIFFERENTIAL CORE INDUCTANCE

Russell E. Tompkins, Scotia; John P. Walden, Schenectady, both of N.Y., and Loren H. Walker, Salem, Va., assignors to General Electric Company, New York, N.Y.

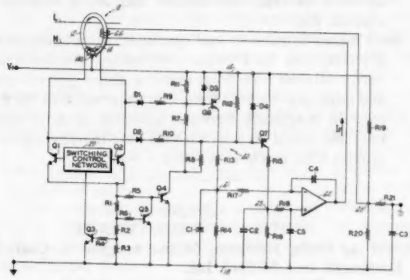
Filed May 16, 1979, Ser. No. 39,628
Int. Cl.[3] G01R *1/02*
U.S. Cl. 324—127 **13 Claims**

10. Apparatus for sensing low frequency primary current excitation of a current transformer having a closed magnetic core of soft magnetic material, said apparatus including, in combination:

A. an AC voltage source connected to drive high frequency exciting current through a secondary winding on the core and thereby exercise the core over an operating loop of the core's B-H curve, said exciting current having alternating positive and negative peaks of uniformly equal amplitudes insufficient to saturate the core,

(1) said operating loop being symmetrical with respect to the positive and negative saturation levels of the core's B-H curve in the absence of primary current excitation, and

(2) in the presence of primary current excitation, said operating loop being shifted on the core's B-H curve such that it is no longer symmetrical with respect to the positive and negative saturation levels;



B. means responsive to said secondary exciting current for developing a first signal proportional to the average slope of said operating loop over a first region thereof during the positive half cycle of the flux wave generated in the core by said secondary exciting current and a second signal proportional to the average slope of said operating loop over a corresponding second region thereof during the negative half cycle of the flux wave, the slopes of said operating loop over said first and second regions being equal in the absence of primary current excitation; and

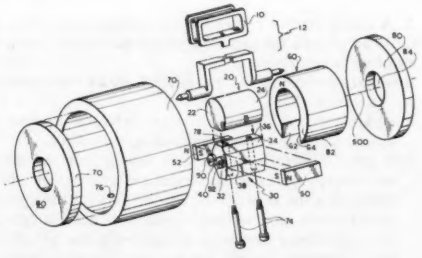
C. means responsive to the differential of said first and second signals for developing an output signal proportional to the primary current excitation.

4,276,511

MAGNETIC SYSTEMS FOR LONG SCALE ELECTRICAL METER WITH MULTIPLE SIDE COIL SENSING

Willem J. L. Boreas, Sayreville, N.J., assignor to Sangamo Weston, Inc., Newark, N.J.

Filed Jul. 31, 1978, Ser. No. 929,885
Int. Cl.[3] G01R *5/08*
U.S. Cl. 324—150 **7 Claims**



1. A magnetic system for a rotor having a coil, said coil including at least two radially oriented sides and at least two axially oriented sides, for four side coil sensing, said magnetic system comprising:

at least one magnet having poles;

a core pole piece;

an outer annular pole piece having two axial ends, said outer annular pole piece surrounding said core pole piece and spaced therefrom, both of said pole pieces magnetically coupled to the same pole of said at least one magnet;

an inner annular pole piece, magnetically coupled to the other pole of said at least one magnet, said inner annular pole piece having an inside radius and disposed substantially between said core pole piece and said outer annular pole piece and defining an inner annular air gap between said core pole piece and said inner annular pole piece and defining an outer annular air gap between said inner annular pole piece and said outer annular pole piece; and

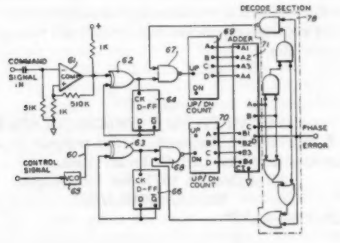
two radial pole pieces, each magnetically coupled to said same pole and positioned proximate each axial end of said outer annular pole piece and extending radially inwardly at least as far as the inside radius of said inner annular pole piece and spaced therefrom to form radial air gaps, whereby the axially oriented sides of said coil move in said inner and outer annular air gaps through parallel but opposing radial magnetic fields, and the radially oriented sides of said coil move in said radial air gaps through axial but opposing magnetic fields.

4,276,512

PHASE DETECTOR FOR PHASE LOCKED LOOPS

Ernest C. Wittke, West Caldwell, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed May 21, 1979, Ser. No. 41,045
Int. Cl.³ H03D *13/00*
U.S. Cl. 328—133 **11 Claims**



1. A phase processing system comprising:

logic level pulse means for converting a sinusoidal signal input to logic level signal,

a counting means,

an adder means,

driving means responsive to said logic level pulse means for driving said counting means,

said counting means driving said adder means whereby the outputs of said counting means are added in said adder means with the carry signal ignored, the most significant bit from said adder means being 0 when said adding means is less than half its range and being 1 when the output of said adder means is above-mid-range, and

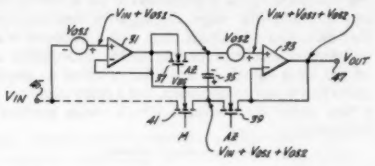
decoding means for decoding the output of said adder means to block upcount when the adder output exceeds a first predetermined limit and to block downcount when the adder output falls below a second predetermined limit.

4,276,513

AUTO-ZERO AMPLIFIER CIRCUIT WITH WIDE DYNAMIC RANGE

Craig E. Johnston, Woodinville, and Ramesh C. Goyal, Mountlake Terrace, both of Wash., assignors to John Fluke Mfg. Co., Inc., Mountlake Terrace, Wash.

Filed Sep. 14, 1979, Ser. No. 75,708
Int. Cl.³ H03F *1/02, 1/00*
U.S. Cl. 330—9 **29 Claims**



1. In an auto-zero amplifier circuit wherein an operational amplifier is switched between an auto-zero mode of operation during which the value of the input offset voltage of the operational amplifier is determined and stored on a capacitor and an accurate amplification mode of operation during which the stored value of the input offset voltage is summed with an input signal to compensate for the input offset voltage of the operational amplifier, the improvement comprising:

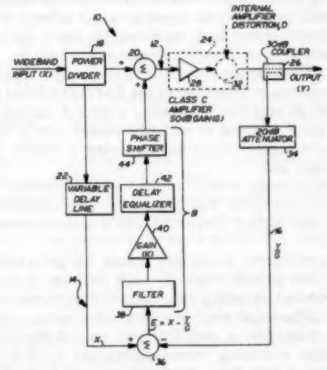
first circuit means for applying the input signal to a common junction between the input of the operational amplifier and one side of the capacitor during the auto-zero mode of operation and second circuit means for applying the output of the operational amplifier to the other side of the capacitor during the auto-zero mode of operation, said first and second circuit means further connecting said capacitor in shunt with the input of the operational amplifier during the auto-zero mode of operation and in series with the input signal during the accurate amplification mode of operation.

4,276,514

WIDEBAND, PHASE COMPENSATED AMPLIFIER WITH NEGATIVE FEEDBACK OF DISTORTION COMPONENTS IN THE OUTPUT SIGNAL

Marshall Y. Huang, Rancho Palos Verdes, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jul. 9, 1979, Ser. No. 55,672
Int. Cl.³ H03D *1/00*
U.S. Cl. 330—149 **10 Claims**



1. An amplifier system comprising:

an amplifier having at least one stage of signal amplification

coupled along a primary signal path to receive a system input signal and provide an amplified system output signal in response thereto;

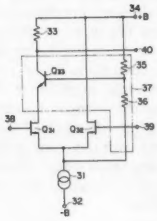
a negative feedback loop having fixed time delays therealong and including a summing junction coupled to provide distortion signal components as the difference between the system input signal and a portion of the amplified system output signal, the negative feedback loop being coupled to provide the distortion signal components as negative feedback to the primary signal path by adding the distortion signal components to the input signal ahead of a first amplifier stage, the negative feedback loop further including a bandpass filter with a passband at a range of frequencies corresponding to the information content of the input signal, an amplifier coupled to amplify the distortion signal components, and a delay equalizer having a time delay therethrough which varies inversely with frequency.

4,276,515

DIFFERENTIAL AMPLIFIER CIRCUIT ARRANGEMENT WITH STABILIZED INPUT IMPEDANCE

Yutaka Nishimoto, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 16, 1979, Ser. No. 12,701
Claims priority, application Japan, Mar. 1, 1978, 53-25989[U]
Int. Cl.³ H03F *3/45*
U.S. Cl. 330—253 **6 Claims**



1. In a differential amplifier circuit for use as an input stage of an audio circuit, and having a stabilized input impedance and a signal input terminal and an output terminal, comprising:

load means;

a first amplifying transistor having a first current-carrying electrode, a second current-carrying electrode coupled to a first power supply line through said load means for said first transistor and to said output terminal of said differential amplifier circuit, and a current-control electrode connected to said signal input terminal of said differential amplifier circuit and receiving an input signal from a relatively high impedance input signal source;

a second amplifying transistor having a first current-carrying electrode connected to the first current-carrying electrode of said first transistor, a second current-carrying electrode coupled to said first power supply line, and a current-control electrode receiving a certain reference voltage; and

constant current source means inserted between the commonly connected first current-carrying electrodes of said first and second transistors and a second power supply line,

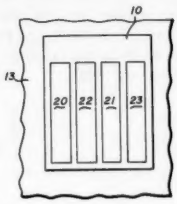
the improvement comprising means for preventing distortion due to said relatively high impedance input signal source and including voltage stabilizing means coupled to said differential amplifier circuit for acting only on the first transistor of said first and second transistors, said voltage stabilizing means comprising a third transistor having a first main electrode connected to the second current-carrying electrode of said first transistor, a second main electrode connected to said load means and to said output terminal, and a control electrode held at a substantially constant potential relative to the first current-carrying electrode of said first transistor by circuit means which is associated with the first current-carrying electrode of said first transistor, the coupling between said second current-carrying electrode of said second transistor and said first power supply line being a direct connection, thereby maintaining substantially constant a potential across the first and second current-carrying electrodes of said first transistor.

4,276,516

THERMAL STRESS REDUCTION IN IC POWER TRANSISTORS

James S. Congdon, Santa Clara, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 26, 1979, Ser. No. 61,158
Int. Cl.³ H03F *3/26*
U.S. Cl. 330—272 **10 Claims**



1. In an integrated circuit designed for high power operation and including at least first and second output transistors, said output transistors operating to account for most of the power dissipation in said circuit and biased so that said first and second output transistors do not dissipate their peak power simultaneously but on an alternating basis, the improvement comprising:

fabricating said first and second output transistors each in the form of a plurality of isolated electrically interconnected sections; and

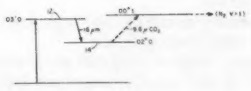
interdigitating said sections so that adjacent sections represent respectively elements of said first and second output transistors.

4,276,517

CO PUMPED CO_2 16 MICRON LASER

Gary L. McAllister, Richland, Wash., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Dec. 19, 1977, Ser. No. 861,985
Int. Cl.³ H01S *3/091*
U.S. Cl. 331—94.5 P **20 Claims**



1. A CO_2 laser emitting 16 micron radiation comprising:

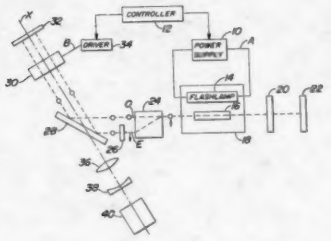
a CO_2 lasable medium having a transition of approximately

16 micron energy between a first excited state at 02°0 and a second relatively higher excited state 03°0;
means for exciting said medium to said second excited state;
means for inducing a transition between said second and first excited states thereby to produce 16 micron radiation.

4,276,518
OPTICAL OSCILLATOR

Gerald D. Ferguson, Yardley, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 1, 1978, Ser. No. 901,955
Int. Cl.³ H01S 3/02
U.S. Cl. 331—94.5 C **11 Claims**



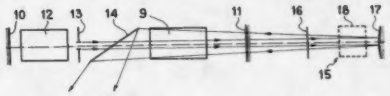
1. A light conduction and transmission system, comprising:
first and second mirrors spatially positioned to form a resonant chamber therebetween;
a light source disposed in the chamber on a first optical axis common with said first mirror for emittng a light beam of first and second polarizations;
switching means disposed in the chamber for selectively rotating the polarization direction of light passing therethrough;
polarizing means disposed in the chamber between said switching means and said first mirror for deflecting light of the first polarization between the first axis and a second optical axis intersecting the first axis near said polarizing means, and for passing light of the second polarization;
beam splitting means disposed in the chamber along said first axis and between said light source and said polarizing means, for dividing said beam of the first and second polarizations into respective first and second substantially parallel paths, and for combining, onto said first axis, light arriving at said beam splitting means on said first and second paths and having the first and second polarizations respectively; and
first polarization changing means disposed in the chamber on one of said paths between said beam splitting means and said polarizing means for changing the first and second polarizations of light passing therethrough one to the other, whereby light of a single polarization is provided to said polarizing means along said first axis.

4,276,519
HIGH YIELD DIFFRACTION LIMITED LASER OSCILLATOR

Jean M. Marteau, Bures-Sur-Yvette, France, assignor to Quantel S.A., France

Filed Oct. 3, 1978, Ser. No. 948,259
Claims priority, application France, Oct. 4, 1977, 77 29757
Int. Cl.³ H01S 3/08
U.S. Cl. 331—94.5 C **21 Claims**

1. A diffraction limited laser oscillator comprising first and second mirrors defining a cavity, an optical amplifying medium and a diaphragm interposed between the mirrors, the diaphragm being placed between the amplifying medium and said first mirror which has a high coefficient of reflection, the oscillator further comprising a polarizer placed between the diaphragm and the amplifying medium and a device for rotating the polarization of the beam of light leaving said cavity through said second mirror, for transforming and returning said beam by reflection to the amplifying medium and the

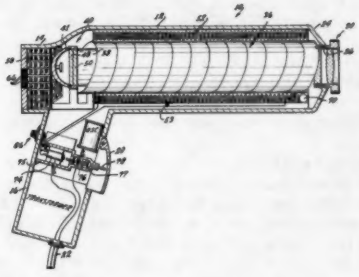


polarizer, said device for rotating the polarization of said beam being located outside said cavity on the path of said beam, whereby, when the beam again reaches the amplifying medium, it has a section substantially equal to the section of the amplifying medium.

4,276,520
PORTABLE LASER DEVICE

Larry Rosenberg, 3440 Caroline Ave., Culver City, Calif. 90230

Continuation-in-part of Ser. No. 647,553, Jan. 8, 1976, and a continuation-in-part of Ser. No. 795,159, May 9, 1977, abandoned. This application Mar. 12, 1979, Ser. No. 19,702
Int. Cl.³ H01S 3/091
U.S. Cl. 331—94.5 P **11 Claims**

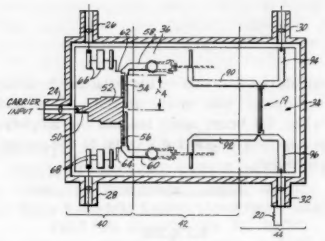


1. A laser beam generating device, comprising
(a) a crystalline laser active media of a generally cylindrically shaped crystal of light amplifying material which is capable of producing a coherent light beam,
(b) a pump source for said crystal in the form of a spiral shaped flash tube disposed about the crystal which can be pumped to produce light which is readily absorbable by the crystal,
(c) electrical power supply means connected to the flash tube for producing a light flash,
(d) a resonant cavity including a partially reflecting front mirror and a rear mirror disposed adjacent the end surfaces of the crystal to provide reflectivity along the crystal longitudinal axis,
(e) a light emitting arc source means disposed behind the rear mirror and in alignment with the crystal longitudinal axis for producing a high intensity light including a wave length that can pass through the rear mirror and is absorbable by the crystal, and
(f) a parabolic light reflecting mirror disposed immediately behind the light emitting arc source means and in alignment with the crystal axis with its focal point disposed at the position of the light emitting arc source.

4,276,521
QUADRIPHASE INTEGRATED HIGH-SPEED MICROWAVE MODULATOR

Roger A. Davidheiser, Manhattan Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Dec. 18, 1978, Ser. No. 970,606
Int. Cl.[3] H03C 3/00; H01P 3/08
U.S. Cl. 332—23 R 4 Claims



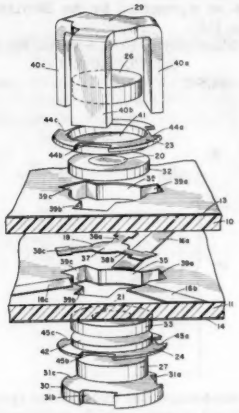
1. A quadriphase modulator comprising: a dielectric substrate having a conductive layer on one surface forming a ground plane; an inphase power splitter circuit including a first conductor on the opposite surface from the ground plane, second and third parallel conductors, a pair of quarter wavelength coupled lines extending transverse to one end of said first conductor and the ends of the second and third conductors, each line including a first conductive strip joined to the first conductor and second and third parallel conductive strips joined to respective ones of the second and third conductors; a pair of biphase switch elements, each element including a coplanar transmission line section formed by an elongated closed loop nonconductive path surrounding an elongated center conductive strip formed in the ground plane and a slot line section formed by an elongated slot in the ground plane intersecting the closed loop path at one end of the center conductive strip, the center conductive strip of each biphase switching element overlapping end portions respectively of the second and third conductors of the power splitter circuit, the overlapping portions being connected electrically through the dielectric substrate, and a pair of diodes connected respectively between the center conductive strip and the ground plane on either side of the slot at the intersection between the slot and the closed loop nonconductive path; a microstrip 90 degree hybrid junction formed on the opposite side of the substrate from the ground plane; transition means coupling the slot line of each of the biphase switch elements to the hybrid circuit; means connecting a modulating reversible polarity bias voltage between the ground plane and said second and third conductors respectively for switching the bias across said diodes; and means for applying a carrier signal from said opposite surface to said pair of biphase switch elements.

3. An inphase power splitter circuit comprising: a dielectric substrate having a conductive layer on one surface forming a ground plane, a first conductor on the opposite surface from the ground plane, second and third parallel conductors, a pair of quarter wavelength coupled lines extending transverse to one end of said first conductor and the ends of the second and third conductors, each line including a first conductive strip joined to the first conductor and second and third parallel conductive strips joined to respective ones of the second and third conductors, the parallel strips providing DC isolation between the first conductor and the second and third conductors, respectively.

4,276,522
CIRCULATOR IN A STRIPLINE MICROWAVE TRANSMISSION LINE CIRCUIT

Leo E. Coerver, Dallas, Tex., assignor to General Dynamics, Pomona, Calif.

Filed Dec. 17, 1979, Ser. No. 104,523
Int. Cl.[3] H01P 1/387
U.S. Cl. 333—1.1 9 Claims



1. In a stripline microwave transmission line circuit disposed in a pattern of printed circuit conductors between a pair of facing dielectric material circuit boards having conductive ground planes on their exposed broad faces, a circulator comprising

at least three printed circuit center conductors disposed between the two boards in a symmetrical array extending radially from a circular hole aligned through the two boards, wherein the center conductors and the ground planes define transmission lines terminating in ports at the circular hole;

a conductive foil having a central portion concentrically disposed within the perimeter of the hole and radially projecting arms arranged in contact with the radially extending center conductors for electrically connecting the center conductors together to form signal paths between adjacent ports;

a pair of pucks of ferrite material of a predetermined size selected to provide circulation of microwave signals of a predetermined wavelength concentrically disposed in the hole on opposite sides of the conductive foil;

a pair of conductive covers in contact with the ground plane conductors to provide an rf ground for the ferrite pucks, and extending to completely enclose the ferrite pucks within the hole;

a magnet disposed in axial alignment with the ferrite pucks for providing a magnetic field through and normal to the central portion of the conductive foil to thereby enable a microwave signal to be circulated from a port defined by one of the center conductors to a port defined by an adjacent one of the center conductors in a direction determined by the direction of said magnetic field; and magnetically permeable material contacting the magnet and concentrically disposed for providing a closed magnetic loop for shielding the circulator; and

a pair of high dielectric material rings disposed in the hole for radially enclosing the pucks and making contact with both the pucks and the surfaces of the boards defining the hole, wherein the radial thickness of each ring is one-quarter said predetermined wavelength for impedance matching the circulator to each of the transmission lines defined by the center conductors and the ground planes,

wherein the improvement comprises

the conductive covers being dished to have respective central portions that are recessed below the ground planes to broadly contact the ferrite pucks and maintain the ferrite pucks in contact with the conductive foil.

4,276,523

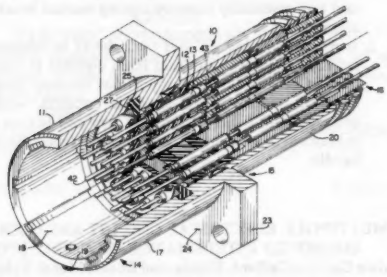
HIGH DENSITY FILTER CONNECTOR

Kamal S. Boutros, Downsview, and Michael J. Coleman, Oshawa, both of Canada, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Aug. 17, 1979, Ser. No. 67,251

Int. Cl.³ H03H *7/01;* **H01R** *13/648, 13/66*

U.S. Cl. 333—182 **26 Claims**



1. A filter connector comprising:

a conductive housing;

an inner body within said housing including at least one longitudinally extending opening and a transversely extending cavity communicating with said opening and said housing;

a filter network means within said opening and at least a portion of said cavity, said network means including an outer ground electrode within at least a portion of said cavity and a pin electrode;

a contact means within said network means, said contact means being electrically coupled to said pin electrode;

conductive filler material within said cavity surrounding and being in electrical connection with said ground electrode; and

a ring means being formed of rigid, electrically conductive material surrounding said filler material along the longitudinal length thereof and being bonded in electrical connection therewith, and said ring means also being electrically coupled to said housing so that said filler material and said ring means form a ground plate for said filter network.

4,276,524

ACOUSTIC SURFACE WAVE DEVICE

Michio Kadota, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Aug. 3, 1978, Ser. No. 930,674

Claims priority, application Japan, Aug. 10, 1977, 52-96469

Int. Cl.³ H03H *9/145, 9/64*

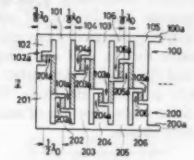
U.S. Cl. 333—194 **17 Claims**

1. An acoustic surface wave device, comprising:

a piezoelectric material adapted for propagating an acoustic surface wave,

at least one electromechanical transducer coupled to a surface of said piezoelectric material at a transducer region thereof, said transducer comprising an interdigital electrode including a pair of comb shaped electrodes, disposed in an interdigital manner, each comb shaped electrode including a common electrode and a plurality of electrode fingers commonly connected to said common electrode, whereby an electrical signal is converted into an acoustic surface wave and an acoustic surface wave is converted into an electrical signal,

at least one of said plurality of electrode fingers including a first portion having a given length connected to said common electrode at one end thereof, a second portion



extending longitudinally from the other end of said first portion having a width narrower then that of said first portion, and

a protruding portion extending longitudinally from said second portion, said protruding portion having a width narrower then that of said second portion.

4,276,525

COAXIAL RESONATOR WITH PROJECTING TERMINAL PORTION AND ELECTRICAL FILTER EMPLOYING A COAXIAL RESONATOR OF THAT TYPE

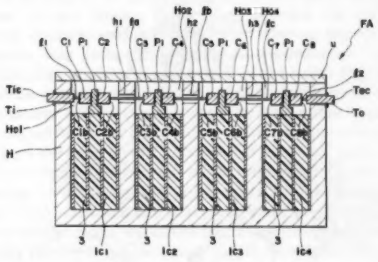
Toshio Nishikawa, Nagaokakyo; Sadahiro Tamura, and Youhei Ishikawa, both of Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Nov. 27, 1978, Ser. No. 963,756

Claims priority, application Japan, Dec. 14, 1977, 52-150949; Dec. 14, 1977, 52-168921[U]; Jun. 22, 1978, 53-76037

Int. Cl.³ H01P *1/205, 7/08*

U.S. Cl. 333—206 **4 Claims**



1. An electrical filter, comprising:

an electrically conductive housing means;

at least two resonator means accommodated in and electrically connected and mechanically secured to said housing means, each of said resonator means comprising a dielectric member having a bore therein, an outer conductor member disposed on the outer periphery of said dielectric member and electrically connected to said housing means, an inner conductor member disposed on the periphery of said bore of said dielectric member, and a terminal electrode member secured to and in direct electrical contact with said inner conductor member, one portion of said terminal electrode means projecting from one end of said resonator means;

an input means for applying electrical signals to said electrical filter;

an output means for removing electrical signals from said electrical filter;

coupling means for electrically coupling said resonator

means to each other at their respective ones of said terminal portions and also to said input and output connector means, said resonator means being so accommodated in said housing means that said terminal electrode members are disposed collinearly with each other and with said input and output connector means; and

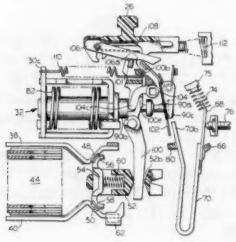
said coupling means comprising a dielectric rod member connected between said input and output means and a plurality of coupling electrodes corresponding in number to said resonator means, said coupling electrodes being provided on said dielectric rod member at spaced intervals such that each coupling electrode forms an electrical connection with a respective one of said terminal portions of said resonator means.

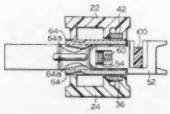
4,276,526

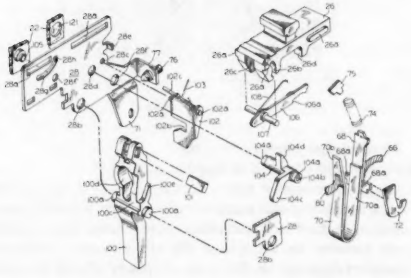
MINIATURE CURRENT LIMITING CIRCUIT BREAKER

Ronald D. Ciarcia, Plantsville, and Robert L. Owens, Plainville, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Jan. 23, 1980, Ser. No. 115,636
Int. Cl.³ H01H 75/12
U.S. Cl. 335—35 **27 Claims**







1. A circuit breaker comprising, in combination:

A. a molded insulative case consisting of a base and a cover;

B. a manual operating handle mounted within said case for movement between ON and OFF positions;

C. a mechanism frame positionally mounted in said base;

D. at least one stationary contact positionally mounted in said base;

E. at least one movable contact;

F. an elongated movable contact operating arm movably mounted by said frame, one end of said arm operatively coupled with said movable contact such that movement of said arm in a closing direction propels said movable contact into engaging relation with said stationary contact and movement of said arm in an opposite, opening direction propels said movable contact away from engaging relation with said stationary contact;

G. a spring continuously biasing said arm for movement in said opening direction;

H. a latch element carried by the other end of said arm;

I. an elongated, pivotal latch lever coupled with said handle and having a latching shoulder latchingly engaging said latch element to translate the movement of said handle between its ON and OFF positions into movement of said arm in said closing and opening directions to effect manual breaker operation, said handle cooperating with said frame to vary the pivotal mounting location of said latch lever pursuant to maintaining its angular relationship with said arm essentially constant during manual breaker operation; and

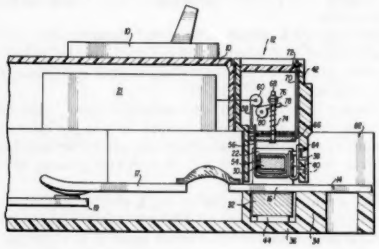
J. trip means acting on said latch lever to disengage said latching shoulder from said latch element in response to current of overcurrent proportions flowing through the engaged stationary and movable contacts, whereby to decouple said handle from said arm and permit opening movement of said arm by said spring independently of said handle.

4,276,527

MULTIPOLE ELECTRICAL CIRCUIT BREAKER WITH IMPROVED INTERCHANGEABLE TRIP UNITS

Alain Gerbert-Gaillard, Tullins, and Robert Morel, Eybens, both of France, assignors to Merlin Gerin, Grenoble, France

Filed Jun. 11, 1979, Ser. No. 47,227
Claims priority, application France, Jun. 23, 1978, 78 19422
Int. Cl.³ H01H 73/48
U.S. Cl. 335—39 **6 Claims**



1. A molded case multi-pole circuit breaker comprising:

a current breaking assembly including adjacent poles each having a pair of separable contacts,

an interchangeable trip unit comprising a trip structure for opening said contacts, said trip unit comprising associated to each pole a magnetic circuit to generally encompass an opening and formed by two separable portions, a first portion having a U-shaped core member with opposite legs and a second portion including a separate rod member having end faces inserted between opposite legs of said U-shaped core member upon assembly of said trip unit,

a main conductor connected in electrical series with said pair of separable contacts and passing through said opening, one of said portions being secured to the breaking assembly and the other being removable and integral with said interchangeable trip unit,

a bimetal support member associated to said other portion and adapted to be heated by hysteresis and eddy current losses therein when said conductor is energized,

a bimetal element supported on said bimetal support member in a heat conducting relationship with said bimetal support member, said bimetal element operating said trip structure in response to being heated a predetermined amount to

effect opening of said contacts to thereby provide a thermal tripping operation,

magnetic air gap means defined between said legs and said end faces wherein the sum of said air gap means is independent of the relative position of said separable portions whereby said hysteresis and eddy current losses in said other portion remain independent of said relative position permitting replacement of the interchangeable trip unit without disconnection of said main conductor and accurate positioning of said separable portions.

4,276,528

ELECTRIC MOTOR-DRIVEN TIMER

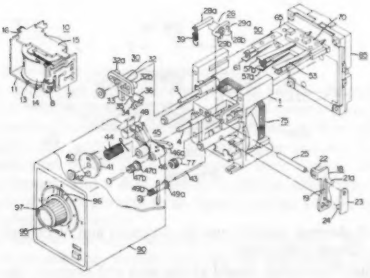
Isamu Ohara; Tsutomu Muranaka, and Hideo Eizumi, all of Nagaokakyo, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Feb. 28, 1979, Ser. No. 16,343

Claims priority, application Japan, Mar. 8, 1978, 53-26806; Mar. 10, 1978, 53-28094

Int. Cl.³ H01H *43/02*

U.S. Cl. 335—75 **7 Claims**



1. An electric motor-driven timer comprising:

an electromagnet having an armature, a synchronous motor having an output shaft for rotating a driven gear, a driven gear rotatable about a first shaft and having a cam surface including a portion defining the end of a timing duration, a clutch means for selectively coupling said output shaft with said driven gear, a contact assembly having a plurality of movable blades each provided with a movable contact, an actuator rotatable about a second shaft for engaging with and moving said movable blades, said actuator having an arm provided with two actuating portions for driving said movable blades and being rotatably supported on said second shaft at an intermediate position between said actuating portions, said actuator including a cam follower selectively engageable with said cam surface to control rotative movement of said actuator, said cam follower imparting rotative movement to said actuator when encountering said cam surface portion;

time setting means for rotating said driven gear and associated cam surface to a desired starting position corresponding to a selected time duration; and

means responsive to a predetermined movement of said armature for operating said clutch menas to couple said output shaft to said driven gear to rotate said driven gear and for causing said cam follower of said actuator to engage with said cam surface, said output shaft said first shaft, said second shaft, and said blades of said contact assembly being in parallel and at approximately right angles to the moving direction of said armature.

4,276,529

MAGNET COIL ARRANGEMENT FOR GENERATING A HOMOGENEOUS MAGNETIC FIELD FOR MAGNETIC RESONANCE ARRANGEMENTS

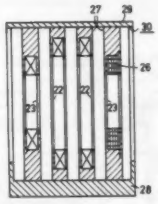
Jürgen Heinzerling, Hamburg, and Rainer Rieckeheer, Quickborn, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 14, 1979, Ser. No. 93,969

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1978, 2849355

Int. Cl.³ H01F *5/00*

U.S. Cl. 335—300 **2 Claims**



1. A magnet coil arrangement for generating a magnetic field which is homogeneous at least in its centre, preferably for magnetic resonance spectroscopy, consisting of four flat, pairwise identical ring coils, coil planes of the ring coils extending perpendicularly to an axis of examination which extends through the coil centres and the coils being symmetrically arranged with respect to a central point on the axis of examination, the ring coils which belong to different pairs having different mean winding diameters as well as rectangular winding cross-sections, the sides of which extend perpendicularly and parallel, respectively, to the axis of examination, the coil pair having the large mean winding diameter being situated between the coils of the pair having the smaller mean winding diameter, current flowing in the same direction through all ring coils, characterized in that the mean winding diameter of the smaller ring coils (**23**) amounts to approximately 0.635 times the mean winding diameter (**Y1**) of the larger ring coils (**22**) and the axial winding width (b) of all ring coils amounts to approximately 0.084 times this diameter, the radial winding height (**41**) of the larger ring coils amounting to approximately 0.162 times the mean winding diameter of the larger ring coils, the radial winding height (**42**) of the smaller ring coils (**23**) amounting to approximately 0.100 times this diameter, the distance (**Z1**) between the central plane of the larger ring coils and the central point (**P**) amounting to approximately 0.144 times this diameter, and the distance (**Z2**) between the central plane of the smaller ring coils and the central point amounting to approximately 0.376 times this diameter, the number of ampere-turns of the larger ring coils being at least approximately 1.65 times the number of ampere-turns of the smaller ring coils.

4,276,530

VAPOR-COOLED ELECTRICAL APPARATUS

Frank W. Benke, and Curtis L. Moore, both of Hermitage, Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Sep. 17, 1979, Ser. No. 75,768

Int. Cl.³ H01F *27/18*

U.S. Cl. 336—58 **6 Claims**

1. Vapor-cooled electrical inductive apparatus, comprising:

a hermetically sealed flowpath, said flowpath including a tank, and water collecting means external to said tank,

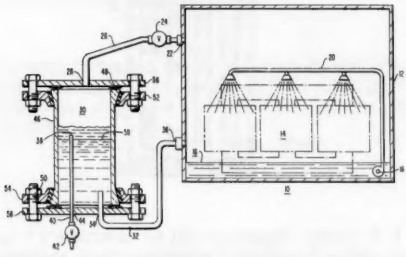
a magnetic core-winding assembly in said tank adapted for energization by a source of electrical potential,

a liquid dielectric containing trace amounts of water disposed in said tank to a predetermined level, said liquid

dielectric and water being immiscible and of different densities,

said magnetic core-winding assembly, when energized, heating said liquid dielectric and water sufficiently to vaporize said liquid dielectric and water into the space above the liquid level in said tank,

said hermetically sealed flowpath being constructed to initiate a predetermined self circulating flow of vapor from said tank to said water collecting means, and liquid from said water collecting means to said tank, and further constructed to deliberately restrict the flow of vapor in said



flowpath to provide a self circulation rate which results in the water collecting means functioning as a water collector, rather than as a heat exchanger, with the temperature of the water collecting means being maintained below the condensation temperature of

said vaporized liquid dielectric and water,

means for segregating the water vapor which condenses in said water collecting means and for preventing it from re-entering the self circulating flowpath,

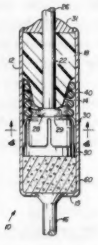
and means for withdrawing said segregated condensed water vapor from said water collecting means.

4,276,531

NONRESETTABLE THERMALLY ACTUATED SWITCH

Merwyn C. Davis, 316 W. Battaglia Rd., Arizona City, Ariz. 85223

Filed Apr. 20, 1979, Ser. No. 32,006
Int. Cl.[3] H01H *37/76*
U.S. Cl. 337—407 **8 Claims**



1. A thermal limiter comprising:

(a) an electrically conductive casing having a wall defining a generally cylindrical interior;

(b) a first electrical conductor secured to said casing and being electrically conductive therewith;

(c) a second conductor extending into said casing interior having contact head therein, said second conductor being electrically insulated from said casing;

(d) contact means engaging said conductive head in a closed position, said contact means having flange means radially deflectable into engagement with said casing interior;

(e) a fusable pellet in said casing adapted to become fluid at a pre-determined temperature;

(f) elastomeric means interposed between said pellet and said contact means deformable to urge said contact flange means radially into contact with said casing interior when an axial force is applied to said elastomeric means and adapted to return to a non-deformed condition when said axial force is removed thereby removing said radial force from said contact flange means; and

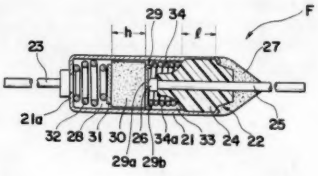
(g) spring means extending between said contact means and said casing whereby reaching fault temperature, said pellet becomes fluid permitting said elastomeric means to return to said non-deformed position thereby allowing said spring means to urge said contact away from the conductor head breading said electrical conductivity between said first and second leads.

4,276,532

THERMAL FUSE

Shigeru Aoki, Takatsuki, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Jun. 27, 1979, Ser. No. 52,816
Claims priority, application Japan, Jul. 8, 1978, 53-94485[U]; Sep. 27, 1978, 53-133298[U]
Int. Cl.[3] H01H *37/76*
U.S. Cl. 337—408 **14 Claims**



1. A thermal fuse for use in electrical and electronic equipment which comprises:

a metallic casing closed at one end and open at one end;

a first conductor extending outwardly from said closed end and being in electrical contact with said casing;

a second conductor having one end axially extending through said open end into the interior of said casing and electrically insulated therefrom, said second conductor having an electrical contact portion at said one end of said second conductor;

an end plug member of an electrically insulative material supporting said second conductor in and insulating said second conductor from said metallic housing;

a contact plate member accommodated in said casing;

a first spring;

a fusible member which is of a material that will melt at a temperature exceeding a predetermined temperature, said first spring and said fusible member being accommodated between said electrical contact portion of said second conductor and said closed end of said metallic casing; and

a second spring disposed in said open end of said casing, and being electrically insulated from said second conductor, and further having one end free for engaging said contact plate member, said first and second springs having respective first, compressed positions when said fusible member is solid, wherein said springs are both compressed and said second spring exerts a force to urge said contact plate member away from said electrical contact portion of said second conductor and said first spring exerts a larger force to urge said contact plate member against said electrical contact portion, whereby said plate member and said contact portion are in mechanical and electrical contact when said springs are in said first position; and said springs further having respective second, relaxed positions when said fusible member is melted, such that in said second

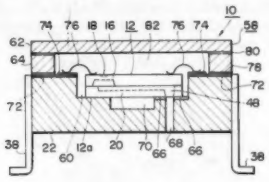
positions, said second spring holds said contact plate member out of electrical contact with said electrical contact member; said second spring further being so constructed that the force it exerts on said contact plate member has a component directed toward the interior wall of said casing so that in said first portion said plate member is in electrical contact with said interior wall of said casing.

4,276,533

PRESSURE SENSOR

Tamotsu Tominaga; Teruyoshi Mihara, both of Yokohama; Takeshi Oguro, Yokosuka, and Masami Takeuchi, Kokubunji, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jan. 30, 1980, Ser. No. 116,795
Claims priority, application Japan, Feb. 2, 1979, 54/10329
Int. Cl.³ G01L *1/22*
U.S. Cl. 338—4 **10 Claims**



1. A pressure sensor comprising:

(a) a diaphragm assembly including a silicon diaphragm block which has a diaphragm, a diffused resistor formed as a pressure-sensitive element on a front surface of the diaphragm, and a silicon support plate bonded to the diaphragm block so as to cover a back surface of the diaphragm, and a first passage communicating from the back of the diaphragm to an opening in the surface of the diaphragm assembly;

(b) a hollow package sealingly accommodating the diaphragm assembly therein such that the assembly is bonded to the inside of the package at a portion of the assembly remote from the diaphragm in the direction of extension of the bonded surfaces of the block and the support plate, and said portion including the opening to the first passage, and that the front surface of the diaphragm and the diffused resistor thereon are spaced from the inside of the package, and having a second passage formed in the package and communicating from the opening to the first passage to the outside of the package; and

(c) a plurality of terminals extending outside the package and electrically connecting to the diffused resistor.

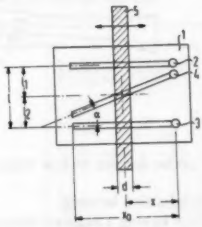
4,276,534

A CONTACTLESS RESISTANCE POTENTIOMETER

Juergen Meyer, Taunusstein; Norbert Schaaf, Wiesbaden, and Claus Kunze, Taunusstein, all of Fed. Rep. of Germany, assignors to Heimann GmbH, Fed. Rep. of Germany

Filed May 10, 1979, Ser. No. 37,824
Claims priority, application Fed. Rep. of Germany, May 23, 1978, 2822477
Int. Cl.³ H01L *31/08*
U.S. Cl. 338—15 **4 Claims**

1. A contactless resistance potentiometer having two exterior electrodes and a tap for dividing the resistance, characterized in that a photoconductor layer is used as resistance element, the usable surface of the photoconductor layer being delimited by two exterior electrodes and being subdivided by a tapping electrode having a definite geometric course between said exterior electrodes, and a partial surface between the exterior electrodes remaining constant as to its size being electrically active by means of exposure, whereby the distance ratio from said tapping electrode relative to said two exterior electrodes is varied by means of displacing the exposure and thus displacing the active partial surface alongside of tapping electrode, in which a first one of said exterior electrodes essentially lies punctiformly in the center of a circular surface of said photo-conductor layer and that the second one of said exterior electrodes circularly surrounds said circular surface, the tapping electrode describing a path between said two exterior



electrodes whose radius is a function of the circular angle and in which the exposed surface is a rotary radial circular segment, and in which a linear interrelationship between the rotation of the exposed circular sector and the resistance divider ratio exists, and that the tapping electrode with its radius r takes a course dependent upon rotary angle (ϕ), upon the smallest radius r_o and upon the largest radius r_1 according to the formula

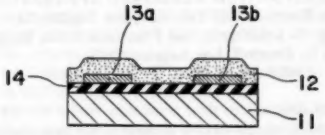
$$r = r_o \exp\left(\frac{\phi}{2\pi} \ln \frac{r_1}{r_o}\right)$$

4,276,535

THERMISTOR

Tsuneo Mitsuyu, Hirakata; Kiyotaka Wasa, Nara, and Shigeru Hayakawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation-in-part of Ser. No. 933,742, Aug. 15, 1978, abandoned. This application Feb. 27, 1980, Ser. No. 125,231
Int. Cl.³ H01C *7/04*
U.S. Cl. 338—22 R **14 Claims**

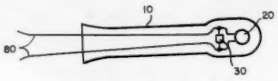


1. A thermistor comprising a base support, a temperature sensitive resistance layer of silicon carbide applied by sputtering deposition on one surface of said base support, and electrode means electrically connected to said temperature sensitive resistance layer of silicon carbide.

4,276,536
SELF-HEATING THERMISTOR PROBE FOR LOW TEMPERATURE APPLICATIONS

Jeffry A. Wisnia, Burlington, Mass., assignor to Scully Electronic Systems, Inc., Wilmington, Mass.

Filed Sep. 4, 1979, Ser. No. 72,452
Int. Cl.³ H01C *7/13, 7/02, 7/04*
U.S. Cl. 338—23 **9 Claims**



1. A thermistor probe for use in low temperature applications comprising:

(a) a thermally conductive housing;

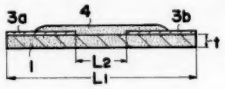
(b) a first thermistor having a negative temperature coefficient located in said housing, said first thermistor having two output terminals and two electrically conductive leads each attached to a corresponding output terminal, said leads extending out of said housing; and

(c) a second thermistor having a positive temperature coefficient located in said housing and connected in parallel with said first thermistor, said first thermistor thermally and electrically responsive to said second thermistor, the electrical effect of said second thermistor being negligible when said first thermistor is at an operating temperature.

4,276,537
MOISTURE-RESPONSIVE RESISTOR ELEMENT

Hiroshi Shimizu, Mooka, Japan, assignor to Sanyo Silicon Electronics Co., Ltd., Tochigi, Japan

Filed Dec. 18, 1979, Ser. No. 104,711
Claims priority, application Japan, Dec. 20, 1978, 53-159423; Dec. 21, 1978, 53-159424
Int. Cl.³ H01L *7/00*
U.S. Cl. 338—35 **5 Claims**



1. A moisture-responsive resistor element of the direct current driving type for measurement of the relative humidity, which comprises metastannic acid as a moisture-responsive resistance material.

4,276,538
TOUCH SWITCH KEYBOARD APPARATUS

Franklin N. Eventoff, 2351 Lakeview, Los Angeles, Calif. 90039, and Serge A. Tcherepnin, San Francisco, Calif., assignors to Franklin N. Eventoff, Los Angeles, Calif.

Filed Jan. 7, 1980, Ser. No. 110,416
Int. Cl.³ H01C *10/00*
U.S. Cl. 338—69 **19 Claims**

1. A multiple touch switch apparatus for being selectively actuated in response to the application of at least one transverse force comprising:

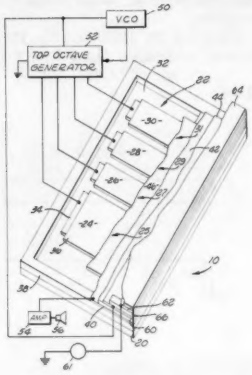
a first support ply having a top surface;

at least one multiple segment conductor ply positioned on the top surface of the first support ply, comprising:

a plurality of first electrically isolated conductor segments immediately adjacent but laterally displaced from one another and having a surface area whereby at least a selected one of the first electrically isolated conductor segments is simultaneously contacted in response to the application of a single transverse touch force;

a second support ply having a top surface and a bottom surface;

a unitary conduction ply positioned on the bottom surface facing and transversely spaced from the at least one multiple segment conduction ply, the second support ply and unitary conduction ply being resiliently deformable for deforming the unitary conduction ply into electrical contacting relationship with at least one selected multiple segment conductor ply in response to the application of



the transverse force, the unitary conductor ply comprising:

a first conductive layer positioned on the bottom surface of the second support ply, and

a first semiconductor composition layer

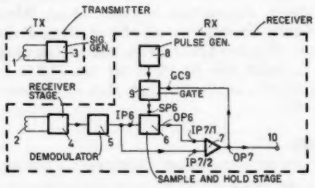
positioned on the first conductive layer for facing the at least one multiple segment conductor ply; and

a transverse spacer positioned laterally between each multiple segment conductor ply and transversely between the first and second support plies for spacing the unitary conduction ply from the at least one multiple segment conductor ply.

4,276,539
VEHICLE DETECTION SYSTEMS

Kamran Eshraghian, Hectorville, and Robert E. Bogner, College Park, both of Australia, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 22, 1978, Ser. No. 903,185
Int. Cl.³ G08G *1/01*
U.S. Cl. 340—38 L **4 Claims**



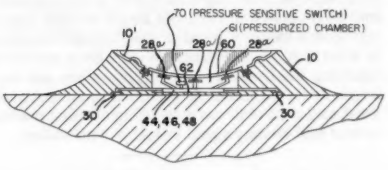
1. A vehicle detection system comprising a transmitter for supplying a continuous wave signal, a receiver and sensing means for coupling said continuous wave signal to said receiver so that the passage of a vehicle produces a disturbance in the envelope of the signal received by said receiver, said

receiver including means for deriving, from the received signal, sample voltages corresponding to the level of the envelope of the received signal at periodically reoccurring sampling instants, storage means for storing each sample voltage until the next succeeding sampling instant, means for comparing each storage sample voltage with the envelope level of the received signal and generating a first signal indicative of the presence of a vehicle when the difference between the envelope level and the stored sample voltage exceeds a predetermined quantity and for terminating said first signal when said difference drops below said predetermined quantity thereby identifying disturbances of the envelope of the received signal having a rapidly changing leading edge produced by an approaching vehicle, and feedback means for preventing the storage means from storing further samples in response to said first signal.

4,276,540
REMOTE CYCLE ALARM SYSTEM

Fred G. Habib, Jr., 6231 W. Newport, Chicago, Ill. 60634

Continuation-in-part of Ser. No. 839,985, Oct. 6, 1977, Pat. No. 4,188,614. This application Sep. 24, 1979, Ser. No. 77,894
Int. Cl.³ B60R *25/10*
U.S. Cl. 340—63 **4 Claims**



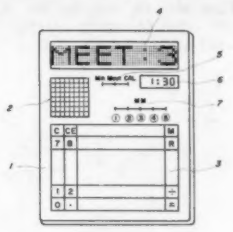
1. A remote alarm system for preventing theft of vehicles comprising:
- housing means being positioned on a support surface for co-operative engagement with a wheel of a vehicle,
- actuating means being disposed on said housing means for generating contact closures upon disengagement of said housing means with the wheel,
- transmitter means disposed in said housing means and being responsive to said actuating means upon a contact closure,
- said housing means having a chamber adapted to be pressurized and said chamber containing at least said transmitter means,
- said chamber including pressure sensitive means coupled to said transmitter means for generating an additional contact closure upon depressurization of said chamber due to tampering with said housing, and
- said transmitter means adapted to transmit a signal to a remote receiving means upon the occurrence of a contact closure or additional contact closure.

4,276,541
DISPLAY CONTROL OF HAND-WRITTEN, MEMORIZED PATTERN AT A PRESELECTED TIME

Tomohiro Inoue, Yoshino; Akira Tanimoto, Kashihara, and Isamu Washizuka, Soraku, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 23, 1979, Ser. No. 14,725
Claims priority, application Japan, Feb. 24, 1978, 53-21090
Int. Cl.³ G04C *23/00;* **G06K** *9/00*
U.S. Cl. 340—146.3 SY **17 Claims**

1. An electronic display system comprising:
- a display panel;
- input means for introducing a desired pattern to be displayed on said display panel;
- a first storage means including a plurality of storage blocks for storing the introduced pattern therein;
- time information input means for introducing a desired time at which said pattern is desired to be displayed on said display panel;
- a second storage means including a plurality of storage blocks for storing the introduced time information therein;
- means for directly accessing one of said blocks of said first storage means and one of said blocks of said second storage means for storing said introduced pattern and said introduced time information therein;
- a current time information keeping circuit for providing current time information therein;

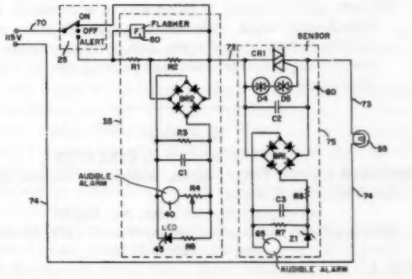


- a detection circuit means for developing a detection output when said time information stored in one of said blocks of said second storage means is identical with the current time information provided by said current time information keeping circuit; and
- display driver means for displaying said pattern stored in said one of said blocks of said first storage means on said display panel in response to said detection output derived from said detection circuit means.

4,276,542
ALARM SYSTEM FOR DWELLINGS

Raymond Russ, 44 Joyce Dr., Fairborn, Ohio 45324

Filed Dec. 22, 1978, Ser. No. 972,465
Int. Cl.³ G08B *7/00*
U.S. Cl. 340—326 **10 Claims**



1. An emergency signaling system using an existing two-wire circuit between a switch located within a dwelling and an externally mounted lamp,
- said switch having an "off" position, a normally "on" position, and an "alert" position,
- first circuit means associated with said switch and connectable in series with said two-wire circuit, said first circuit means being responsive to said "alert" position of said switch for interrupting the current to said externally mounted lamp at a periodic rate, and
- said lamp being connected to said two-wire circuit and having associated therewith an audible alarm, and second circuit means, responsive to the interruption of the current in said two-wire circuit, for activating said alarm;
- whereby said lamp will flash and said alarm will be sounded

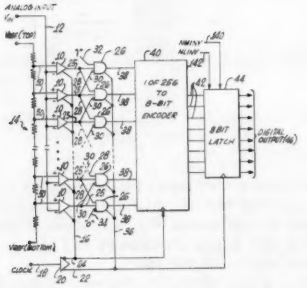
at said periodic rate when said switch is placed in the "alert" position, and whereby said lamp will light continuously and said alarm will be silent when said switch is placed in the "normally on" position.

4,276,543

MONOLITHIC TRIPLE DIFFUSION ANALOG TO DIGITAL CONVERTER

Ralph W. Miller, and James G. Peterson, both of Manhattan Beach, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Mar. 19, 1979, Ser. No. 21,577
Int. Cl.[2] H03K *13/175*
U.S. Cl. 340—347 AD **9 Claims**



1. A monolithic parallel analog-to-digital converter having an n-bit binary output, where n is at least **5**, said converter comprising:

2^n-1 comparators;

voltage divider means to provide 2^n-1 uniformly graduated reference voltage levels for application to one terminal of each of said comparators;

means for coupling an analog input voltage to the other terminal of each of said comparators; and

encoding logic means for converting output signals from said comparators to an equivalent n-bit binary signal; and

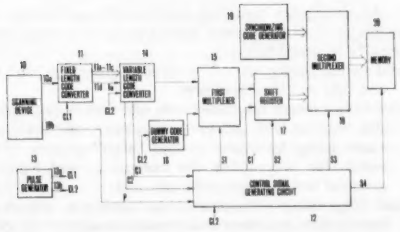
wherein said converter is fabricated in accordance with a high-density triple diffusion process providing a high resolution feature geometry and correspondingly small junction depths, to provide high packing density and high production yield.

4,276,544

CODE CONVERTING CIRCUITS

Kazumoto Iinuma, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1979, Ser. No. 31,987
Claims priority, application Japan, Nov. 8, 1978, 53-137494
Int. Cl.[3] H04N *7/12*
U.S. Cl. 340—347 DD **7 Claims**



1. A code converting circuit wherein an input signal is converted into a word code train, each word thereof comprising N bits, said code converting circuit comprising:

means for generating parallel variable length codes corresponding to said input signal;

means for generating a code length code regarding the length of said variable length codes;

a first shifter controlled by the code length signal for switching the connection between input and output terminals to produce a surplus of one word;

a register connected to temporarily store the output of said shifter, means for feeding back the output of said register to the input of said first shifter;

a dummy code generating means for generating parallel dummy codes;

a first multiplexer for selecting either one of said parallel variable length codes and said parallel dummy codes;

a second shifter connected to receive the output of said first multiplexer and the output of said register to form a code of word unit length;

means for parallelly generating a specific code having a length of at least one word and utilized as a synchronizing code;

a second multiplexer for selecting either one of said synchronizing code and the output of said second shifter; and

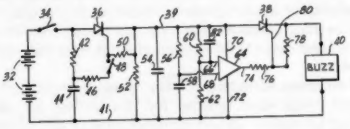
a control means for causing said second multiplexer to produce said synchronizing code before producing said variable length codes of word unit length and for controlling said second shifter to produce said variable length codes in word unit length in accordance with a control signal regarding the length of said surplus, when said variable length codes terminate at an intermediate point of one word, said control means controlling said first multiplexer to send said dummy signal to said second shifter.

4,276,545

DOOR ACTIVATED BURGLAR ALARM UTILIZING TIME DELAY

Clifford W. Jarvis, Clearwater, and John E. Pearson, St. Petersburg, both of Fla., assignors to Crime Fighter, Inc., Clearwater, Fla.

Filed Sep. 24, 1979, Ser. No. 77,904
Int. Cl.[3] G08B *13/08*
U.S. Cl. 340—545 **4 Claims**



1. In a burglar alarm system comprising a door switch electrically interconnected for activating a noise-emitting device and an operating circuit arranged to connect in series a power supply means having a positive terminal and a negative terminal, an on-off switch and the noise-emitting device, the improvement comprising:

the door switch having terminals arranged to be in open and closed positions in response to the door being closed and opened, respectively;

a controlled rectifier being interposed into the operating circuit so as to have an anode connected to the on-off switch for receiving a positive potential from the power supply means and a cathode interconnected to the noise-emitting device;

charging circuit for a capacitor comprising said capacitor being electrically coupled to the negative terminal of the power supply means and, through a first resistor, to a circuit point on the operating circuit between the on-off switch and the controlled rectifier;

a discharge circuit and exit time delay network comprising a second resistor being connected from a circuit point on

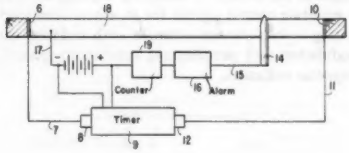
the charging circuit between the first resistor and the capacitor, through the door switch, to the gate of the controlled rectifier, and further comprising a third resistor connected from the cathode of the controlled rectifier to the negative terminal of the power supply means, and further comprising a fourth resistor connected between the gate and the cathode of the controlled rectifier, whereby the capacitor will not be sufficiently charged to provide an operative triggering current pulse to the controlled rectifier until the on-off switch is closed and the door switch is opened by closing the door, and whereby the charging of the capacitor creates a predetermined exit time delay in arming the noise-emitting device after the door is closed.

4,276,546

MOTOR SKILLS TESTER

Alvin Krass, 205 Holland Rd., Holmdel, N.J. 07733

Filed Jun. 6, 1980, Ser. No. 156,935
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—576 **7 Claims**



5. A device for testing the motor skills of a person with impaired brain function which comprises, in combination

(a) a planar solid having plurality of slots cut out thereof;

(b) said slots being shaped in a variety of widths and geometric shapes of differing complexity varying from straight lines to curves, angles and circles;

(c) said slots having electric contacts at either end connected to the start and stop mechanism of a timing means;

(d) said slots having all the edges lined with an electrically conducting material connected to at least one means for effecting an alarm and with an electrically activated counting means; and

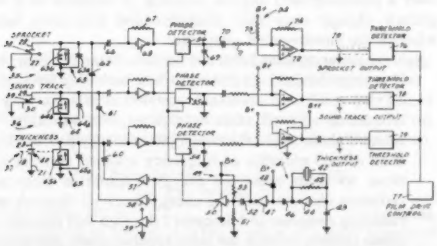
(e) a hand held electrically conducting stylus connected electrically to said alarm means such that each contact with said electrically conducting slot lining activates said alarm and said counting means.

4,276,547

FILM THICKNESS DETECTION SYSTEM

Howard Bowen, Wilmette, and John S. Little, Evanston, both of Ill., assignors to Research Technology, Inc., Lincolnwood, Ill.

Filed Dec. 22, 1977, Ser. No. 863,513
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—675 **8 Claims**



1. A motion picture film flaw detection system comprising:

(a) film guide means determining a path of travel of film;

(b) variable capacitance means adjacent said path of travel of the film for having its capacitance thereof varied in correspondence with film irregularities of a predetermined nature; and

(c) detecting means for sensing said capacitance changes and means for activating a control when said capacitance variations exceed a predetermined threshold of change,

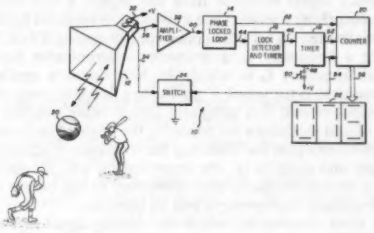
(d) said detecting means comprising a phase detector means for detecting phase changes in a signal caused by said capacitance changes and with the frequency of said signal remaining substantially constant.

4,276,548

MICROWAVE SPEED METER

Erno B. Lutz, Sunnyvale, Calif., assignor to Solfan Systems, Inc., Mountain View, Calif.

Filed Jun. 4, 1979, Ser. No. 45,237
Int. Cl.³ G01S *13/58*
U.S. Cl. 343—7 PL **10 Claims**



1. A meter for measuring the relative velocity of balls and the like employed in sporting activities comprising, in combination:

diplexer means for generating a beam of object illuminating microwave energy, for receiving doppler shifted microwave energy reflected from the object and for detecting said reflected doppler shifted microwave energy to develop a difference signal having a coherent component the frequency of which is proportional to the relative velocity of the object;

phase-locked loop means including clock signal generating means, said phase-locked loop means for synchronizing the frequency of said clock signal generating means to that of the coherent component of said difference signal and for developing a lock signal indicative of when such synchronization has been achieved;

lock detector and timer and means responsive to said lock signal for developing a stabilization signal after the frequency of said clock signal generating means has been synchronized for a predetermined stabilization period;

counter timing means responsive to said stabilization signal for developing a reset signal upon receipt of said stabilization signal and for developing a latch signal a predetermined count period thereafter;

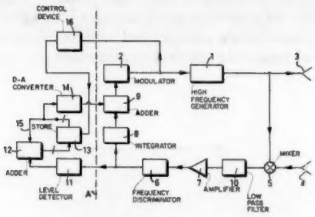
counter means reset by said reset signal for counting the cycles of said clock signal occurring between the occurrence of said reset and latch signals to develop a sum signal; and

means responsive to said sum signal for displaying the relative velocity of the object.

4,276,549
FM-CW RADAR DISTANCE MEASURING APPARATUS

Jean-Pierre Tomasi, Velizy, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 15, 1979, Ser. No. 94,610
Claims priority, application France, Dec. 26, 1978, 78 36312
Int. Cl.³ G01S *13/32*
U.S. Cl. 343—7.5 **1 Claim**



1. An improved FM-CW radar distance measuring apparatus, of the type comprising means for generating a high-frequency signal whose frequency is linearly modulated by a modulator generating a sawtooth signal having a variable period T, the period T being in a linear relationship with the distance to be measured, means for transmitting the high-frequency signal to an object and means for receiving the high-frequency signal reflected from the object, a first feedback loop comprising a mixer stage to which the received signal and the transmitted signal are applied for generating a beat signal having a frequency f_b, a frequency discriminator having a central frequency f_0 to which the beat signal is applied for generating an error which is applied to a first integrator circuit, the output of said first integrator circuit being coupled to an input of said modulator for adjusting the angle of inclination of the sawtooth signal for rendering the frequency f_b substantially constant and equal to f_0, the improvement which comprises:

(1) a second feedback loop connected to the output of the frequency discriminator and comprising:

a level detector to which the output signal of the frequency discriminator is applied;

a second integration circuit, connected to the output of the level detector said second integration circuit being a sampling-type digital integrator;

(2) combining circuit means connected to the output of the first integration circuit and the input of the modulator for combining the output signals produced by the two integration circuits;

(3) means connected to the output of the modulator for controlling the sampling rate of the second integration circuit by generating within each period of the sawtooth voltage an equal number of consecutively occurring control signals where the frequency of the control signals increases with increasing slope of the sawtooth signal.

4,276,550
SCAN PATTERN ESTIMATOR FOR AN ELECTROMAGNETIC SENSOR

Thomas L. Loposer, Greenville, Tex., assignor to E-Systems, Inc., Dallas, Tex.

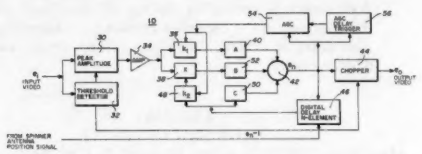
Filed Dec. 27, 1978, Ser. No. 973,565
Int. Cl.³ G01S *1/02*
U.S. Cl. 343—100 CL **23 Claims**

1. A scan pattern estimator for use in a scanning electromagnetic sensor system in which electromagnetic radiation is repetitively scanned and sensed for a plurality of scan cycles to produce data signals corresponding to the sensed electromagnetic radiation, said scan pattern estimator comprising:

combining means responsive to the data signals for producing output signals;

delay means for receiving the output data signals from the combining means and producing delayed signals corresponding to the output signals delayed for a period of one scan cycle; and

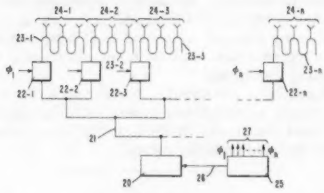
said combining means including means for receiving the data signals and the delayed signals and generating an output varying as the product of the data signals of each scan cycle multiplied by the output signals of the immediately previous scan cycle, and means for summing the product output of the means for receiving with the delayed signals to generate output signals for an entire scan cycle representing a scan pattern estimate with reduced extraneous modulation and pertubations relative to sensed electromagnetic radiation.



4,276,551
ELECTRONICALLY SCANNED ANTENNA

Frederick C. Williams, Topanga, and Wolfgang H. Kummer, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Jun. 1, 1979, Ser. No. 44,618
Int. Cl.³ H04B *7/00*
U.S. Cl. 343—100 SA **6 Claims**



1. An electronically scanned antenna comprising a plurality of frequency scanned antenna sections, each of said sections having a plurality of radiating elements, said sections being responsive to electromagnetic energy in a predetermined frequency band, each of said sections being adapted to provide at least one spatially steerable beam which is angularly steerable over a predetermined angular subtense in response to a frequency change over said predetermined frequency band, wherein the improvement comprises:

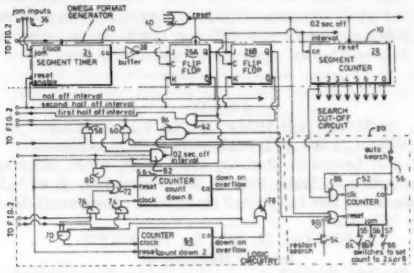
said frequency scanned antenna sections being colinear; and

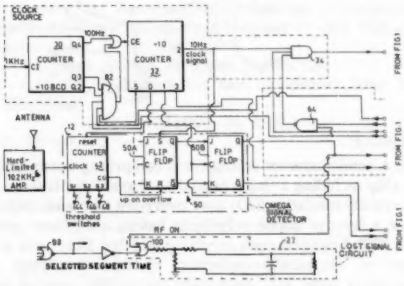
said antenna further comprising means, including a plurality of phase shifters individually coupled to said plurality of frequency scanned antenna sections, for adjusting the relative phase of the electromagnetic energy processed by each of said plurality of frequency scanned antenna sections, so as to cause the energy transmitted from said radiating elements and the energy received through said radiating elements and processed through said plurality of phase shifters to have the same relative phase distribution as if provided by a continuous linear frequency scanned antenna.

4,276,552
AUTOMATIC SYNCHRONIZATION FOR RECEIVERS OF A NAVIGATIONAL SYSTEM

William J. Garmany, Livingston, N.J., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 26, 1978, Ser. No. 973,320
Int. Cl.³ G01S 1/30
U.S. Cl. 343—105 R 12 Claims





1. A synchronization arrangement for a receiver of an essentially worldwide navigational network comprising:

first means to receive navigational signals from said network having a predetermined format;

second means to generate timing signals having said predetermined format;

counting means coupled to said first and second means to provide a count of signals at an output of said first means in a prescribed short time interval and to provide a high logical output when a predetermined count threshold has been exceeded, said high logical output indicating the absence of said navigational signal; and

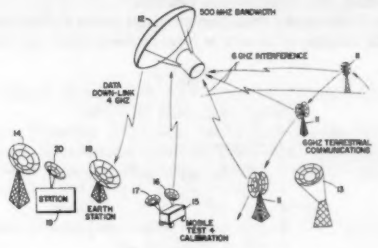
logic circuitry coupled to said second means and said counting means responsive to said high logical output and certain other conditions to shift the timing of said second means to synchronize said timing signals to said received navigational signals.

4,276,553
APPARATUS AND METHOD FOR DETERMINING THE POSITION OF A RADIANT ENERGY SOURCE

Gustave J. Schaefer, El Segundo, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 24, 1977, Ser. No. 780,873
Int. Cl.³ G01S 3/02
U.S. Cl. 343—112 R 7 Claims

1. A method of determining the position of a point source of radiant energy with respect to its spatial position on a celestial body from a location remote from the source comprising the steps of scanning in first and second orthogonal directions the beam of a narrow beam width transducer for the energy over a region of the celestial body including the source, detecting a peak level of energy transduced by the transducer in each of the scanning directions, correlating the scanning position of the beam in each of said directions with the occurrence time of each peak and combining the positions of the beam corresponding with each peak by scanning the indicator of an X-Y

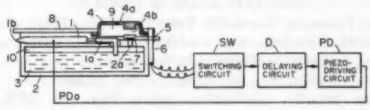


recorder in the X and Y directions in synchronism with the beam being respectively scanned in the first and second directions, whereby X and Y traces are formed by the recorder to indicate the detected position in said first and second directions on the X and Y traces, and determining an intersection of lines drawn parallel to the X and Y directions and including the detected peak positions, thereby determining the source position with respect to its spatial position on the celestial body.

4,276,554
INK JET MECHANISM FOR PURGING AND ACTIVATING

Koji Terasawa, Fuchu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 3, 1980, Ser. No. 109,277
Claims priority, application Japan, Jan. 24, 1979, 54/7568
Int. Cl.³ G01D 15/18
U.S. Cl. 346—140 R 4 Claims



1. An ink jet mechanism comprising:

an ink jet head;

a diaphragm for recovering said ink jet head from nozzle blockage and meniscus retrogradation when pressure is applied; and

means for generating an electric signal in response to a pressing operation of said diaphragm.

4,276,555
CONTROLLED AVALANCHE VOLTAGE TRANSISTOR AND MAGNETIC SENSOR

Albert W. Vinal, Cary, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

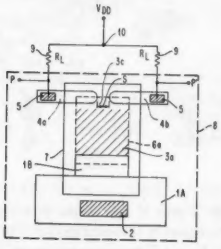
Filed Jul. 13, 1978, Ser. No. 924,489
Int. Cl.³ H01L 29/82
U.S. Cl. 357—13 70 Claims

1. An avalanche transistor having a base region of first conductivity type and spaced emitter and collector regions of second conductivity type forming respective PN junctions with said base region, said emitter and collector regions being connected to a source of electrical potential of proper polarity

and magnitude to forward bias the emitter-base junction and to reverse bias the collector-base junction into avalanche generation of excess minority and majority carriers in said base region, said collector collecting said minority carriers;

a region of second conductivity type having a higher resistivity than said emitter region and extending from said emitter toward said collector region, said region of second conductivity type separating said emitter from said base region only at the portion of said emitter-base junction facing said collector-base junction,

a localized impact ionization promoter means for facilitating the creation of an area of local covalent bond ruptures in



the portion of the total area of said collector base junction lying closest to said emitter, said promoter means affecting a portion of said area which is smaller than the total portion thereof which lies closest to said emitter, said promoter means extending from said collector-base junction area towards said emitter and serving to increase the local energy density in said smaller area to produce, upon supply of said area with said minority carriers from said emitter, an abruptly conducting avalanche current generation of excess minority and majority carriers in an M-factored multiplication process occurring at a characteristic voltage applied between said emitter and collector contacts.

4,276,556

SEMICONDUCTOR DEVICE

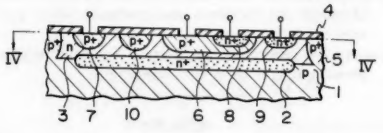
Hiromu Enomoto, Kawasaki; Yasushi Yasuda, Inagi; Hitoshi Ohmichi, Kawasaki, and Yoshiharu Mitono, Tokyo, all of Japan, assignors to Fujitsu Limited, Japan

Filed Nov. 15, 1979, Ser. No. 94,436

Claims priority, application Japan, Nov. 15, 1978, 53-157063[U]

Int. Cl.³ H01L *29/34*

U.S. Cl. 357—52 **8 Claims**



1. A semiconductor device including a diode and a bipolar transistor which are connected to each other and formed in an isolated area of a semiconductor layer of a first conductivity type formed on a semiconductor substrate of the opposite conductivity type, said isolated area comprising a portion of said layer that is surrounded by an isolation region comprising a heavily doped region of said opposite conductivity type extending from the surface of said semiconductor layer at least to said substrate, said isolated area serving as the collector of said transistor and having a base region of said transistor formed therein of said opposite conductivity type, said semiconductor device comprising

a buried region heavily doped with impurities of said first conductivity type located between said layer and said substrate, said buried layer separated from said isolation region, and

a diffusion region of said opposite conductivity type formed between the base region of said bipolar transistor and a region of said isolated area where said diode is formed, and which traverses said isolated area to connect with said isolation region, said diffusion region being separated from said buried region by a portion of said layer.

4,276,557

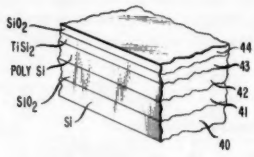
INTEGRATED SEMICONDUCTOR CIRCUIT STRUCTURE AND METHOD FOR MAKING IT

Hyman J. Levinstein, Berkeley Heights; Shyam P. Murarka, and Ashok K. Sinha, both of New Providence, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 29, 1978, Ser. No. 974,378

Int. Cl.³ H01L *23/48*

U.S. Cl. 357—67 **7 Claims**



1. A semiconductor arrangement comprising a semiconductor chip including a single crystal semiconductor layer, a first electrically-insulating SiO_2 layer overlying said semiconductor layer, a layer of doped polysilicon having a thickness greater than 2000 Angstrom units overlying said first SiO_2 layer, a first layer of electrically-conducting material overlying said polysilicon layer, said electrically-conducting material being taken from a class consisting of $TiSi_2$ and $TaSi_2$ and an unpatterned second layer of SiO_2 overlying said first electrically-conducting layer.

4,276,558

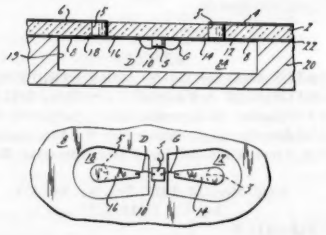
HERMETICALLY SEALED ACTIVE MICROWAVE INTEGRATED CIRCUIT

Pang T. Ho, Mountain View, and Michael D. Rubin, Saratoga, both of Calif., assignors to Ford Aerospace & Communications Corp., Detroit, Mich.

Filed Jun. 15, 1979, Ser. No. 48,872

Int. Cl.³ H01L *23/02, 23/12, 39/02*

U.S. Cl. 357—74 **9 Claims**



1. A radio frequency transistor package including:

a substrate having first and second opposing surfaces;

a signal input microstrip mounted on said first surface of said substrate;

a signal output microstrip mounted coplanar with said signal input microstrip on said first surface of said substrate;

a conductor mounted on said second surface of said substrate defining a ground plane for said input and output microstrips;

a radio frequency transistor mounted on said ground plane conductor;

a first coplanar waveguide element mounted on said second surface adjacent said radio frequency transistor coplanar with said ground plane conductor;

a second coplanar waveguide element mounted on said second surface adjacent said radio frequency transistor coplanar with said ground plane conductor;

said first and second coplanar waveguides each being surrounded by said ground plane conductor and separated therefrom by a field channel;

said transistor being electrically connected to said first and second coplanar waveguide elements.

4,276,559
SYSTEM FOR GENERATING AN ERROR SIGNAL INDICATIVE OF DIFFERENCES BETWEEN RECORDING AND PLAYBACK SPEEDS

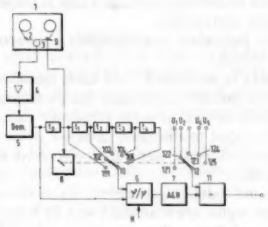
Hubert Foerster, Darmstadt; Winfried Horstmann, Griesheim, and Josef Sochor, Darmstadt, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 15, 1979, Ser. No. 20,729

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1978, 2813206

Int. Cl.³ H04N *5/76, 5/78*

U.S. Cl. 358—8 **5 Claims**



1. In a color television signal recording system having record carrier means (2) having a color television signal including periodically recurring color bursts recorded thereon at a recording speed, means (3) for scanning said record carrier means and furnishing playback signals corresponding to said recorded color bursts, transport means (9) for moving said record carrier means relative to said scanning means at an actual playback speed approximately equal to a selected one of a plurality of selectable playback speeds and phase comparator means (6) having a first and second input for comparing the phase of signals applied to said inputs and furnishing a first error signal indicative of the phase difference therebetween,

apparatus for furnishing a final error signal indicative of the difference between said recording speed and the then present actual playback speed, comprising

delay means comprising a plurality of selectable delay segments selectively providing at least a first delay time $(t_o+t_1+t_2)$ corresponding to the time interval between two sequential ones of said bursts at said recording speed and at least another selected delay time which corresponds to the difference between said selected playback speed and said recording speed, thereby creating delay signals;

means for applying said delayed signals and said playback signals to said first and second input of said phase comparator means, respectively whereby said phase comparator means furnishes a first error signal indicative of the difference between said actual playback speed and said selected playback speed;

means for furnishing a DC voltage corresponding to said selected one of said plurality of playback speeds; and

means (11) connected to said DC voltage furnishing means and said phase comparator means for combining said first error signal and said DC voltage so as to furnish said final error signal corresponding to said difference between said recording speed and said actual playback speed.

4,276,560
COLOR SIGNAL REPRODUCING SYSTEM AND CIRCUIT FOR THE SAME

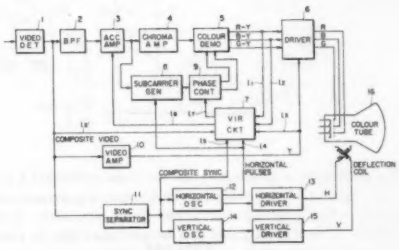
Yasuaki Watanabe, Kasukabe; Yukio Okabe, Noda; Shinichi Kojima, Higashimurayama, and Mitsuya Sato, Kokubunji, all of Japan, assignors to Hitachi, Ltd. and Victor Company of Japan, Limited, both of Tokyo, Japan

Filed Nov. 28, 1978, Ser. No. 964,337

Claims priority, application Japan, Nov. 28, 1977, 52-141642

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—28 **28 Claims**



1. A color signal reproducing system comprising:

a color demodulator circuit which receives a chroma signal and a color subcarrier signal and which delivers a red color difference signal and a blue color difference signal,

a driver circuit which receives a luminance signal and the color difference signals and which drives a picture tube,

a composer circuit which receives the red color difference signal and the blue color difference signal and which delivers the red color difference signal corrected by the blue color difference signal,

a circuit which delivers a reference potential corresponding to a reference level of the received chroma signal,

a detector circuit which generates a detection signal corresponding to a level difference between the reference potential and the corrected red color difference signal at a time when a VIR signal has been received, and

a hue control circuit which controls a phase of the subcarrier signal to be supplied to said color demodulator circuit, by the output signal of said detector circuit.

4,276,561
EARTH PHOTO GLOBE

Jon Friedman, 312 Prince St., Freeport, N.Y. 11520

Filed Apr. 6, 1979, Ser. No. 27,937

Int. Cl.³ H04N *1/04;* **G09B** *27/08*

U.S. Cl. 358—78 **10 Claims**

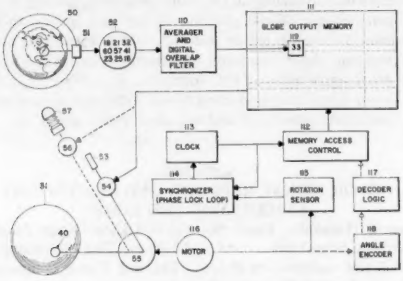
1. A method of making a globe in which geographical indicia comprise quantized image dots disposed on the surface of a sphere, comprising:

storing in a memory data representing said quantized image dots,

providing a photosensitively coated sphere,

scanning a light beam across said photosensitively coated sphere,

obtaining from said memory data representative of the quantized image dot desired at each location scanned by said light beam, and



modulating said light beam in accordance with said obtained data so as to control the exposure of said photosensitive coating to produce quantized image dots corresponding to said memory data.

4,276,562

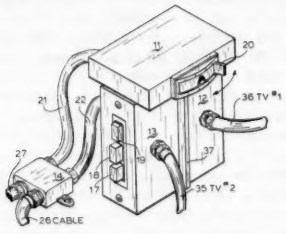
TV SWITCHING SYSTEM

Mark Stewart, and Lynn Stewart, both of 30 Park Ave., New York, N.Y. 10016

Filed Mar. 31, 1980, Ser. No. 135,752

Int. Cl.³ H04N *5/782, 7/16*

U.S. Cl. 358—86 **5 Claims**



1. A switching system for interconnecting various TV sources, such as a subscription television source, a house antenna and a video recorder, to a plurality of TV sets, comprising:

first switch means having a plurality of inputs, a plurality of pushbuttons, a plurality of outputs coupled to respective ones of said TV sets, and having each of its outputs coupled to one of said video recorder, subscription television source and house antenna via respective ones of said inputs in response to activation of a respective one of said pushbuttons; and

second switch means having an output thereof coupled to an input of the video recorder and a pair of inputs coupled, respectively, to the subscription television source and the house antenna.

4,276,563

REPRESENTING A VIDEO SIGNAL UPON THE PICTURE SCREEN OF A VIDEO DISPLAY DEVICE

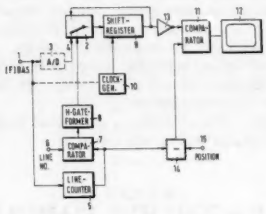
Jürgen Heitmann, Seeheim; Gerhard Illetschko, and Hans-Peter Maly, both of Darmstadt, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 2, 1977, Ser. No. 857,024

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1976, 2655133

Int. Cl.³ H04N *7/02*

U.S. Cl. 358—139 **1 Claim**



1. A method of displaying a selected portion of a video signal upon the picture screen of a video display device employing a horizontal line raster, at least the selected portion of the video signal being in digital form, wherein for the purpose of representing a selected line of the video signal as a function of x and y, the following steps are performed for deriving the y function:

(a) the individual picture elements of the selected line of the video signal are scanned for a complete frame in the line direction and their voltage values are determined,

(b) each determined voltage value is subjected to an analog-digital conversion,

(c) the individual analog-digital converted voltage values are stored,

(d) there is associated with each stored voltage value one line of the line raster upon the picture screen of the video display device in such a manner that equal amplitudes correspond to the same lines,

and the following steps are performed for deriving the x function:

(a) the individual picture elements of the selected line of the video signal are scanned frame by frame in the line direction and their voltage values are determined,

(b) each determined voltage value is subjected to analog-digital conversion,

(c) the individual analog-digital converted values are stored,

(d) with each stored voltage value there is associated one column of a line raster subdivided into a series of columns, in such manner that equal amplitudes correspond to the same columns, and one of the picture elements in the associated line and column is contrasted in respect of its brightness with respect to other picture elements of the line raster, whereby each picture element of the video signal thus represented on the screen has a respective vertical and horizontal displacement determined by its digital value.

4,276,564

TELEVISION SYSTEMS

John B. Watson, and Philip J. Dodds, both of Romsey, England, assignors to Independent Broadcasting Authority, London, England

Filed Nov. 9, 1978, Ser. No. 959,000

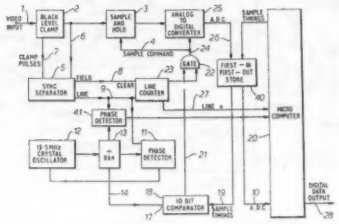
Claims priority, application United Kingdom, Dec. 11, 1977, 47169/77

Int. Cl.³ H04N *7/62, 9/62*

U.S. Cl. 358—139 **4 Claims**

1. In an apparatus for deriving a television quality parameter

from an insertion test signal which is repeated at regular intervals during field blanking periods of a television signal, including sampling means operable, when actuated, to provide a digital amplitude signal representing the instantaneous amplitude at a sampling position of the test signal, controllable actuating means for actuating the sampling means, and computer means for calculating the quality parameter from a plurality of digital amplitude signals corresponding with instantaneous amplitudes at different sampling positions on the test line and provided by the sampling means, said computer means being responsive to timing origins carried by the television



signal for controlling the actuating means at times so related to the timing origins that the signals of said plurality of signals are provided in turn, at an average rate which is low compared with the rate at which the signals occur during a single test signal;

the improvement which comprises

digital store means connected between the sampling means and the computer for storing a plurality of the digital amplitude signals and for storing request signals for said amplitude signals, the arrangement being such that the sampling means is enabled for operation during a line period at a greater rate than the computer.

4,276,565

METHOD AND APPARATUS FOR STANDARDS CONVERSION OF TELEVISION SIGNALS

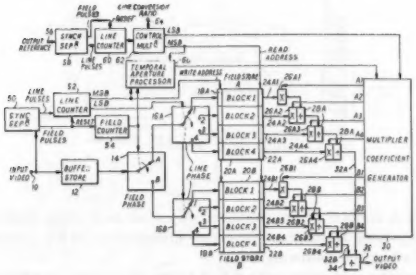
Christopher J. Dalton, High Wycombe, and Graham D. Roe, Great Missenden, both of England, assignors to British Broadcasting Corporation, London, England

Filed Jan. 15, 1979, Ser. No. 3,451

Claims priority, application United Kingdom, Jan. 18, 1978, 2068/78

Int. Cl.³ H04N 5/02

U.S. Cl. 358—140 **24 Claims**



1. A method of simultaneously enabling different parts of an input video signal to be made available, using signal storage, comprising the steps of:

cyclically writing successive portions of the input video signal relating to successive portions of the video picture into a plurality of successive random access store sections, each of which is capable of storing several video lines but less than one field, using in each cycle write addresses for the different sections which are unambiguously related;

incrementing the write addresses for successive cycles; and

reading from the sections using for each section read addresses which are related to each other and to the write addresses so as to access a desired set of stored signal portions.

4,276,566

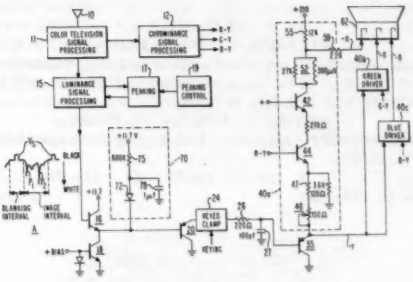
CIRCUIT FOR INHIBITING RADIO FREQUENCY INTERFERENCE IN A TELEVISION RECEIVER

Robert P. Parker, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 10, 1979, Ser. No. 65,453

Int. Cl.³ H04N 5/14, 5/21

U.S. Cl. 358—170 **1 Claim**



1. In a television receiver for processing a wideband video signal occupying a prescribed frequency band and containing a blanking reference level occurring during image blanking intervals of said video signal and being undesirably subject to variations, said receiver including a video signal processing channel including an intermediate low level video signal processing path; an image reproducing kinescope having an intensity control electrode; and means for coupling signals from said intermediate video path to said kinescope intensity control electrode, said coupling means including a video output stage for supplying high level image representative video output signals to said kinescope intensity control electrode; apparatus comprising:

means disposed in said intermediate video signal path for clipping transient peak amplitude excursions of said video signal during image intervals of said video signal, said clipping means including

a charge storage capacitance;

normally nonconductive unidirectional current conducting threshold conduction means coupled between intermediate signal path and said capacitance;

direct current conducting means including an impedance coupled to a direct current potential and said capacitance, said impedance and capacitance defining a time constant which is long relative to the time of a horizontal image interval of said video signal for determining a time varying direct current charge on said capacitance when said threshold means is nonconductive; wherein

said threshold means is rendered conductive to clip transient peak amplitude excursions of low level video signals during said image intervals when the threshold conduction level of said threshold means is exceeded in response to the level of said wideband video signal and the level of charge then appearing on said charge storage means, to substantially preclude rapid changes between saturated and nonsaturated conductive states in said video output stage in response to said transient peak amplitude excursions of said video signal, whereby undesired high frequency interference signals signifi-

cantly above said prescribed frequency band otherwise produced by said rapid changes are minimized; and

low pass filter means coupled between an output of said clipping means and an input of said video output stage, for attenuating signal frequencies above said prescribed frequency band; wherein

said intermediate signal path includes video signal processing means including a signal output network with an associated output current path for conducting a substantially constant current; and

said threshold conduction .neans is coupled to said output current path for enabling current conducted by said threshold means to flow through said current path, thereby limiting the magnitude of current conducted by said threshold means.

4,276,567

RECORDING LINE ELEMENTS

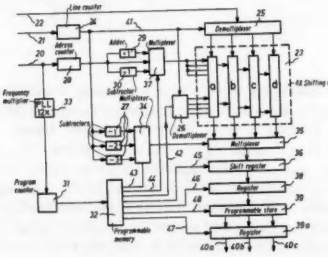
Klaus Wellendorf, Heikendorf, and Gerhard Sing, Raisdorf, both of Fed. Rep. of Germany, assignors to Dr.-Ing Rudolf Hell GmbH, Kiel, Fed. Rep. of Germany

Filed Jul. 23, 1979, Ser. No. 59,560

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1978, 2834456

Int. Cl.³ H04N *1/40*

U.S. Cl. 358—280 **2 Claims**



1. A process for recording line data and screened half-tone pictures comprising the steps of:

(a) scanning a continuous-tone picture by image lines;

(b) simultaneously scanning line data by image lines with the same line resolution as the scanning of the continuous-tone picture;

(c) color correcting and digitising the signal obtained by scanning the continuous-tone picture;

(d) generating a first signal representing different screen dot sizes and forms from said digitised signal obtained from the scanning of the continuous-tone picture;

(e) generating a second signal for recording the line data at a higher resolution by storing several adjacent image lines obtained from the scanning of the line data;

(f) generating a second signal for recording the line data at a higher resolution than the scanning resolution by comparing the density value of each scanned picture dot of the stored line data with the density values of surrounding picture dots and selecting a dot pattern matched in an optimum manner to the second signal from a plurality of dot patterns stored in said higher resolution; and

(g) recording the scanned half-tone picture and line data on a recording medium by separately energising a plurality of recording beams by said first signal to reproduce the half-tone picture and by said second signal to record said line data with improved resolution, said second signal having preference over said first signal.

4,276,568

BOOSTING VIDEO SIGNALS

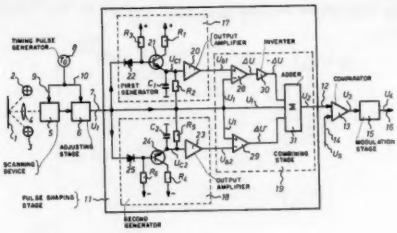
Hermann Wischer, Kiel, Fed. Rep. of Germany, assignor to Dr.-Ing Rudolf Hell GmbH, Kiel, Fed. Rep. of Germany

Filed Aug. 10, 1979, Ser. No. 65,442

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1978, 2837139

Int. Cl.³ H04N *1/40*

U.S. Cl. 358—282 **10 Claims**



1. A method of boosting a video signal, which method consists in deriving from said video signal an upper accompanying signal extending above it and a lower accompanying signal extending below it, said accompanying signals following said video signal dynamically, forming first differential values continuously between said upper accompanying signal and said video signal, forming second differential values continously between said video signal and said lower accompanying signal, subtracting multiples of said first differential values continuously from said video signal and adding multiples of said second differential values continuously to said video signal.

4,276,569

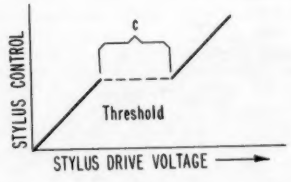
METHOD AND APPARATUS FOR PRODUCING A FACSIMILE GRAY SCALE

John H. Kirk, Jr., Orlando, Fla., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 20, 1979, Ser. No. 31,951

Int. Cl.³ H04N *1/22, 1/30, 1/40*

U.S. Cl. 358—298 **9 Claims**



6. A method of generating a gray scale on a copy medium comprising aluminized paper by juxtaposition with a stylus including the following steps:

driving said stylus with a first range of voltages to produce white to increasingly gray marks on said copy medium;

driving said stylus with a second range of voltages to produce increasingly gray to black marks on said copy medium; and

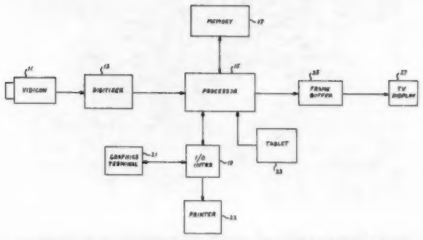
the voltage in said first range producing the darkest gray differing substantially in magnitude from the voltage in said second range producing the lightest gray of said second range.

4,276,570

METHOD AND APPARATUS FOR PRODUCING AN IMAGE OF A PERSON'S FACE AT A DIFFERENT AGE

Nancy Burson, 548 Broadway - 4th Floor, New York, N.Y. 10012, and Thomas D. Schneider, Boulder, Colo., assignors to Nancy Burson, New York, N.Y.

Filed May 8, 1979, Ser. No. 36,847
Int. Cl.³ H04N *7/18*
U.S. Cl. 358—903 **14 Claims**



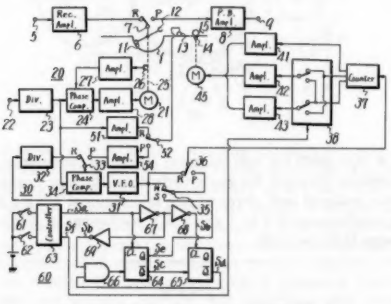
1. A method of simulating the appearance of a face at a different age comprising:
(a) recording a picture of an old face;
(b) recording a picture of a young face;
(c) finding and recording the difference between the old and young face;
(d) recording a picture of a face to be transformed to simulate said face at a different age;
(e) modifying said face to be transformed with said differences; and
(f) displaying said face to be transformed modified with the differences.

4,276,571

SLOW OR STILL MODE VIDEO SIGNAL REPRODUCING APPARATUS WITH INCREMENTED TAPE MOVEMENT

Hitoshi Sakamoto, Zama, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 813,237, Jul. 6, 1977, abandoned. This application Feb. 28, 1979, Ser. No. 16,022
Claims priority, application Japan, Jul. 13, 1976, 51-83119
Int. Cl.³ H04N *5/78*; G11B *15/20*
U.S. Cl. 360—10 **8 Claims**



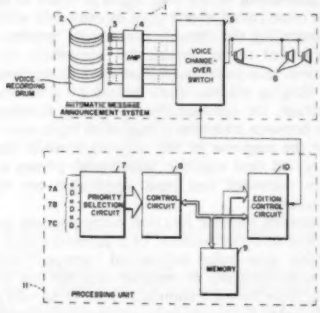
1. In an apparatus for reproducing a video signal recorded in parallel slant tracks at a predetermined pitch on a recording medium, and which apparatus includes record medium transport means for advancing the record medium in a direction to cause reproducing of signals recorded in successive ones of said slant tracks, and pulse responsive means for controlling the operation of said transport means: a transport control mechanism comprising control circuit means for selectively providing pulses at the option of a user to said pulse responsive means for advancing said record medium a distance equal to a predetermined fraction of said pitch of said parallel slant tracks in response to each said pulse.

4,276,572

AUTOMATIC MESSAGE ANNOUNCEMENT SYSTEM

Yoshiro Hayashi; Akira Sugihara; Takaki Shimura, all of Tokyo; Kozo Ishikawa, Yokohama; Kiyoshi Wada; Eiji Yamanaka, both of Toyko, and Shunsuke Senba, Yokohoma, all of Japan, assignors to Japanese National Railways; Fujitsu Limited and Fujitsu Kiden Ltd., all of, Japan

Continuation-in-part of Ser. No. 883,170, Mar. 3, 1978. This application Oct. 26, 1979, Ser. No. 88,639
Claims priority, application Japan, Sep. 11, 1976, 51-108963
Int. Cl.³ G11B *5/00*
U.S. Cl. 360—12 **14 Claims**

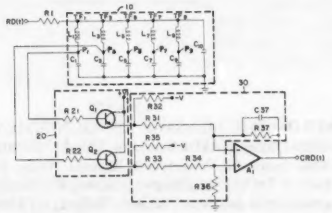


1. An automatic message announcement system for announcing the departure, arrival and approach of vehicles, comprising:
announcement command input signal generation means for generating announcement command input signals upon the departure, the arrival and the approach of vehicles;
priority selection circuit means for giving priority order to each said announcement command input signal and generating an interruption signal when a second announcement command input signal is generated while automatic announcement is being performed on the basis of a first announcement command input signal, the interruption level of said interruption signal depending on the priority order of the announcement command input signals;
a memory which stores codes corresponding to partial message announcement segments;
a processing means for reading out the memory content and composing a message pattern to be announced on the basis of the announcement command input signal and re-editing a new message pattern to be announced on the basis of the interruption level when said interruption signal is generated;
a voice recording medium for storing a plurality of voice elements; and
voice edition control circuit means for controlling announcement of message patterns given from the processing means.

4,276,573
PULSE SHAPING NETWORK FOR DISC READ CIRCUITRY

Petcr H. Halpern, Longwood, Fla., and Charles E. Lawrence, Boerne, Tex., assignors to Datapoint Corporation, San Antonio, Tex.

Filed Jun. 29, 1979, Ser. No. 53,546
Int. Cl.³ G11B *5/09*
U.S. Cl. 360—45 **22 Claims**



1. In apparatus for reading encoded digital data recorded at high density as bivalent states of a moving magnetic medium and providing a read signal formed by a sequence of bivalent transition pulses, a pulse shaping network for the band width-limited processing of the read signal in order to substantially decrease intersymbol interference or cross talk without significantly degrading the signal-to-noise ratio, thereby obtaining a corrected read signal suitable for accurately decoding the information, said pulse shaping network comprising:

pulse shaping means, characterized by a network transfer function, for substantially decreasing intersymbol cross talk between transition pulses of an input read signal such that the response of the network transfer function is a corrected read signal in which peak phases are substantially corrected and peak amplitudes are substantially equalized;

said network transfer function corresponding in harmonic content to a combination of a predetermined number of suitably gain-scaled half-period harmonic transfer functions, each having an impulse response that is a substantially finite time duration sine pulse of an odd multiple of half cycles, the predetermined duration of each sine pulse being less than or substantially equal to the bit cell interval of the encoded digital data;

the harmonic content of said network transfer function being sufficiently band width-limited that the corrected read signal response of said network transfer function is substantially band width-limited, and the signal-to-noise ratio is not significantly degraded.

4,276,574
READ/WRITE AND TUNNEL ERASE MAGNETIC HEAD ASSEMBLY

Holger J. Baasch, Rochester, and Francis S. Luecke, Byron, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 6, 1979, Ser. No. 101,027
Int. Cl.³ G11B *5/27*
U.S. Cl. 360—121 **8 Claims**

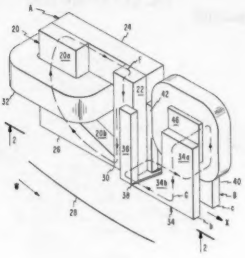
1. A magnetic head assembly having an elongate active face and including:

a pair of magnetically permeable data transfer core portions having faces forming parts of said active face and providing a data transfer gap between them extending transversely across said active face,

a data transfer coil on one of said core portions,

a pair of magnetically permeable erase core portions having faces that form parts of said active face and extending along and in contact with the opposite sides of one of said data transfer core portions,

a second pair of magnetically permeable erase core portion having faces that form parts of said active face, each of said second pair of erase core portions extending in the direction of said elongate active face from and in alignment with one of said first named pair of erase core portions and providing an erase gap which is between it and the respective one of said first named erase core portions



and which extends essentially transversely across said active face,

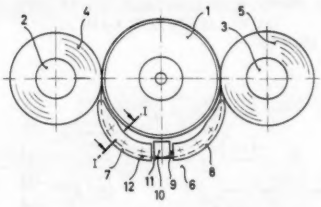
a bridging core portion of magnetically permeable material disposed between and magnetically connecting said second pair of erase core portions, and

an erase coil disposed on said bridging core portion.

4,276,575
TAPE GUIDE FOR HIGH-SPEED TAPE TRANSPORT APPARATUS

Klaus Schoettle, Heidelberg; Werner Hoffmann, Ludwigshafen; Eduard Kaemmer, Mutterstadt; Klaus Boehlke, Hessheim, and Helmut Lewin, Bobenheim-Roxheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 906,443, May 17, 1978. This application Oct. 18, 1979, Ser. No. 86,136
Claims priority, application Fed. Rep. of Germany, May 18, 1977, 2722509
Int. Cl.³ G11B *15/60*
U.S. Cl. 360—130.21 **16 Claims**



1. A tape guide for tape transport apparatus, wherein at least the material forming the guide surface for the tape consists of plastics material and lubricant, the said material having a surface roughness of 0.1 to 1 μm and a coefficient of friction of between 0.20 and 0.40.

4,276,576
LIGHTNING ACTIVATED RELAY

Martin A. Uman, and Ronald B. Standler, both of Gainesville, Fla., assignors to Lightning Location and Protection, Inc., Tucson, Ariz.

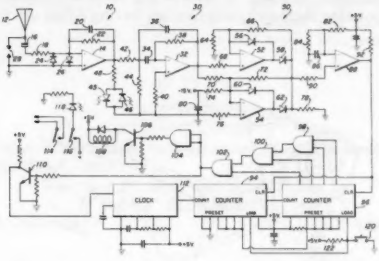
Filed Dec. 27, 1978, Ser. No. 973,764
Int. Cl.³ H02H *1/04*
U.S. Cl. 361—1 **33 Claims**

1. A lightning protection system usable for protecting equip-

ment operated from an electrical power source upon the occurrence of atmospheric conditions likely to produce lightning comprising:

means for detecting the field produced by electrical storms;

switching means having a first condition of operation wherein said equipment is in an operational condition and a second condition of operation wherein said equipment is in a protected condition, said switching means being responsive to said detecting means for placing said electrical equipment in said protected condition upon the detection of said field; and



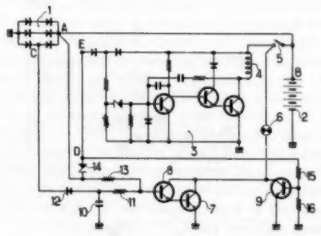
means operatively coupled to said electrical power source and to said switching means for rendering said switching means operative to place said electrical equipment into said protected condition upon the occurrence of an interruption in the power provided by said electrical power source.

4,276,577

MOTOR VEHICLE BATTERY CHARGING INSTALLATION

Michel Gruson, Creteil, France, assignor to Ducellier & Cie, France

Filed Jan. 24, 1979, Ser. No. 6,167
Claims priority, application France, Feb. 2, 1978, 78 02850
Int. Cl.[3] H02H *7/20*; G05F *1/58*
U.S. Cl. 361—91 **3 Claims**



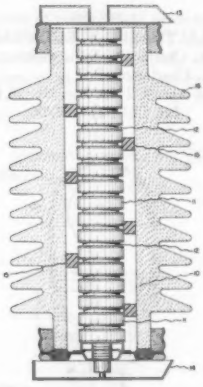
1. A motor vehicle battery charging installation comprising the combination of an alternator having an output, a rectifier connecting the alternator to the battery to be charged, a voltage regulator connected to control the output of the alternator in accordance with the battery voltage, a warning lamp and a control transistor means therefor connected across the battery, means connected directly between the control transistor means and the rectifier for biasing said control transistor means to conduct and thereby energize and illuminate said warning lamp when said alternator fails to produce its output, means connected directly between the control transistor means and the rectifier for turning the said control transistor means off when the alternator is producing an output, a zener diode connected directly between the rectifier output and an auxiliary input of the voltage regulator to provide regulation at an increased voltage level should the connection between the alternator and the battery be interrupted, and means controlled by current flow through said zener diode for overridingly illuminating said warning lamp when the said zener diode conducts, said control transistor means being operative to control the energization of the said warning lamp to indicate the failure of the alternator to produce an output and to further indicate the occurrence of an interruption of the connection between said alternator and said battery.

4,276,578

ARRESTER WITH GRADED CAPACITANCE VARISTORS

Lionel M. Levinson, Schenectady; Howard F. Ellis, Stephentown, both of N.Y., and Herbert Fishman, Pittsfield, Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed May 10, 1979, Ser. No. 37,874
Int. Cl.[3] H02H *3/22*
U.S. Cl. 361—127 **13 Claims**



1. An arrester for surge protection of power transmission lines comprising:

an elongated insulating housing having a ground terminal and a line terminal disposed at opposite ends thereof;

a plurality of metal oxide varistors disposed within said housing and configured in a stack, said varistors being electrically connected in series, the varistor at a first end of said stack being connected to said line terminal and the varistor at the second end of said stack being connected to said ground terminal, said varistors exhibiting increased intrinsic capacitance with increased proximity to said line terminal.

4,276,579

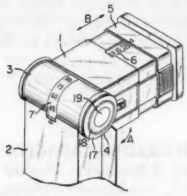
PHOTOGRAPHIC FLASH DEVICE

Hikoya Yako, Osaka, Japan, assignor to West Electric Co., Ltd., Osaka, Japan

Filed Mar. 29, 1979, Ser. No. 24,909
Claims priority, application Japan, Jul. 4, 1978, 53/46212[U]
Int. Cl.[3] G03B *15/02*
U.S. Cl. 362—5 **2 Claims**

1. A photographic flash device having a flash section comprising a flash tube which flashes by means of the energy charged on a main discharge capacitor and a reflector, a flash light emission angle variable mechanism which has a single transparent panel and which can vary the flash light emission angle by changing the distance of said panel from said flash tube, a flash light emission angle display coupled to and controlled by said flash light emission angle variable mechanism, an exposure information section upon which are displayed aperture, film speed, and distance to a subject, and a connecting mechanism which interconnects said flash light emission angle variable mechanism and said exposure data section so

that the displays of said exposure data section may be varied when the flash light emission angle is varied by means of said flash light emission angle variable mechanism, whereby the



operation of said flash light emission angle variable mechanism correspondingly varies the display of the flash light emission angle and the exposure information.

4,276,580

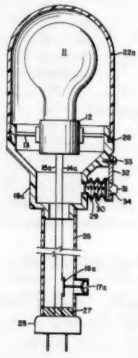
PRESSURE ACTUATED ELECTRICAL SYSTEM

Charles J. Rogers, Charleston, S.C., assignor to C. J. Rogers Enterprises Inc., Charleston, S.C.

Filed Apr. 9, 1979, Ser. No. 28,172

Int. Cl.³ F21V *25/00*

U.S. Cl. 362—22 **9 Claims**



1. An electrical system comprising

(a) a hermetically sealed chamber,

(b) an electrical circuit member within said chamber adapted to be connected to a power source,

(c) means for changing the volume of said chamber after the hermetic seal has been established, thereby to create a pressure differential between the space within said chamber and the ambient atmosphere, and

(d) means responsive to the loss of said pressure differential to provide a signal to said circuit member.

4,276,581

HEADLIGHT TILTING SYSTEM FOR VEHICLES

Shinichi Orii, Fujisawa, and Masao Ishikawa, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 20, 1979, Ser. No. 22,030

Claims priority, application Japan, Mar. 22, 1978, 53-36494[U]

Int. Cl.³ B60Q *1/06*

U.S. Cl. 362—40 **9 Claims**

1. In a headlight tilting system for a vehicle, said system having at least one headlight mounting frame pivotally mounted to the body of said vehicle,

a source of electromotive force (E.M.F)

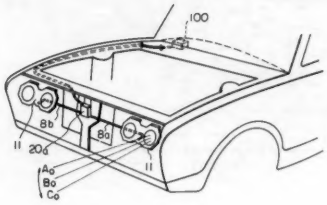
an electric motor said motor having first and second terminals;

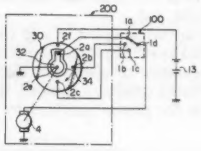
a rotary shaft in drive connection with said motor;

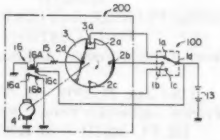
linkage means operatively interconnecting said rotary shaft and said frame for causing said frame to oscillate in response to the rotation of said motor; and

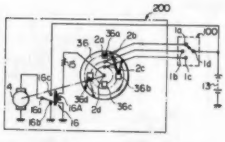
circuit means for selectively connecting said motor to said source so that said frame is caused to oscillate and for disconnecting said motor from said source and simultaneously short circuiting said motor, including

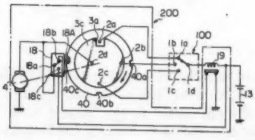
a member mounted to said rotary shaft for synchronous rotation therewith, said member having a first electrically











conductive portion and at least one second portion electrically isolated from said first portion;

a plurality of sliding contacts which slide on said member, a first group of said sliding contacts being arranged to slide only on said first portion and a second group which each cyclically slide on said first and second portions in a manner that only one of said second group slides on said second portion at one time;

a manually operatable switch having a plurality of stationary contacts each connected to one of said second group and

a movable contact which can be set to contact a stationary contact which corresponds to one of said second group in contact with said first portion so that electric current flows between said one of said second group and said first group and that said motor rotates said member until said second portion comes into contact with said one of said second group whereupon said source is disconnected from said motor; and

switching means for short circuiting said motor upon said member rotating to the position in which said second portion comes into contact with said one of said second group.

4,276,582

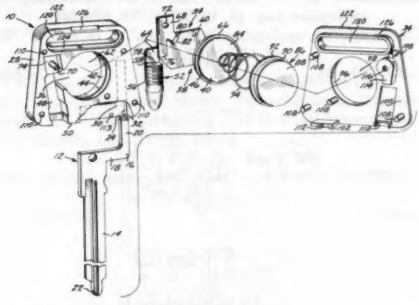
KEY WITH LIGHT

John Burnett, Irvine, Calif., assignor to Lock Light Corporation, Laguna Beach, Calif.

Filed Dec. 26, 1978, Ser. No. 972,983

Int. Cl.³ F21V *33/00*

U.S. Cl. 362—116 **18 Claims**



1. A key apparatus comprising:

a first handle member having at least one peripheral side edge and a cavity with an opening into the peripheral side edge;

a key body including a substantially elongated first portion and a second portion contiguous to the first portion, the second portion extending from the first portion in a direction having a directional component other than the general longitudinal axis of the first portion, the second portion dimensioned to be slideably fitted into the cavity;

a second handle member having a surface dimenioned to be juxtaposed to and interface with a surface of the first handle member, the second handle member also having a peripheral side edge and at least one protrusion on the peripheral side edge said protrusion being adapted to at least partially cover the opening of the cavity whereby the key body member is securely locked in the cavity, the protrusion preventing the key body member from sliding out of the cavity, and

means for physically attaching the interfacing first and second handle members.

4,276,583

NOVEL RECTANGULAR HEADLIGHT FOR AUTOMOBILE

Hector Fratty, Boulogne S. Seine, France, assignor to Cibie Projecteurs, Bobigny, France

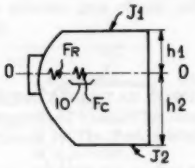
Filed May 11, 1978, Ser. No. 904,960

Claims priority, application France, May 23, 1977, 77 15698

Int. Cl.³ F21M *3/14*

U.S. Cl. 362—214 **1 Claim**

1. A headlight for automobiles, with a substantially rectangular front opening, of the type comprising a parabolic reflector having an optical horizontal axis along which are disposed a light filament for dipped-beam illumination cooperating with cut-off means, and a light filament for far-beam illumination positioned rearwardly of said light filament for dipped-beam illumination, a horizontal upper side and a horizontal lower side intersecting the reflector to delimit the substantially rectangular opening of the headlight, wherein the upper side is substantially closer to said axis than the lower side, with the result that, for a total, unchanged height of the headlight, the zone of the reflector furnishing the dipped-beam illumination is



reduced, and the zone of the reflector furnishing the far-beam illumination is increased, and wherein said upper side is distant from said optical axis by the distance h_1 and said lower side by a distance h_2, characterized by the inequation:

$$\frac{1}{4}h_2 < h_1 < \frac{1}{2}h_2;$$

this allowing an optimum compromise for far-beam and dipped-beam illumination.

4,276,584

AUTOMOTIVE HEADLIGHT

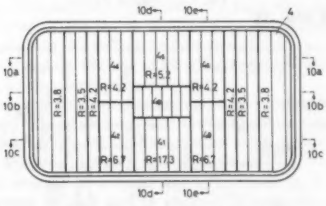
Matsuo Ichikawa, Gunma, Japan, assignor to Ichikawa Press Industries Co., Ltd., Takasaki, Japan

Filed Aug. 4, 1978, Ser. No. 931,190

Claims priority, application Japan, Mar. 29, 1978, 53/40561[U]

Int. Cl.³ F21V *5/02*

U.S. Cl. 362—308 **5 Claims**



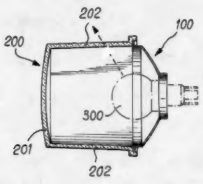
1. An automotive headlight, comprising: a concave reflector having a reflecting surface in the shape of a paraboloid of revolution; a light source having a horizontal filament located substantially at the focus of said reflecting surface so that light from said filament is reflected forwardly as parallel horizontal rays from said reflecting surface; a diffuser lens covering the open forward end of said reflector, said diffuser lens having means for effecting horizontal diffusion of light reflected from said reflecting surface, said diffuser lens also having an upwardly refracting prism part so that the upper edges of the light distribution patterns from each part of said reflecting surface substantially coincide with each other at a location spaced a selected distance horizontally forwardly from said lens, said upwardly refracting prism part increasing in thickness in the upward direction.

4,276,585

RECTANGULAR-OPENING SEALED BEAM UNITS FOR AUTOMOBILE LIGHTING

Alain Deverrewaere, La Varenne, France, assignor to Cibie Projecteurs, Bobigny, France

Filed Mar. 5, 1979, Ser. No. 17,305
Claims priority, application France, Mar. 7, 1978, 78 06437
Int. Cl.³ F21V *13/04*
U.S. Cl. 362—308 **4 Claims**



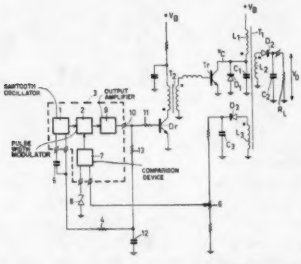
1. A sealed beam headlight for a motor vehicle, comprising:
(a) a metal reflector having a parabolic contour, the reflector, when viewed from the front, having a substantially rectangular shape wherein its width is greater than its height, the outer edge of the reflector including two side edge portions and upper and lower edge portions, each of the upper and lower edge portions extending rearwardly from the side edge portions along a generally arcuate path, and
(b) a translucent lens covering the front of the reflector, the lens, when viewed from the front, having a substantially rectangular shape wherein its width is greater than its height, and the outer edge of the lens having a shape complementary to that of the outer edge of the reflector so that when the reflector and lens are assembled their outer edges meet.

4,276,586

TUNED SWITCHED-MODE POWER SUPPLY

Antonius Boekhorst, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 23, 1979, Ser. No. 23,110
Claims priority, application Netherlands, Apr. 6, 1978, 7803661
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—21 **14 Claims**



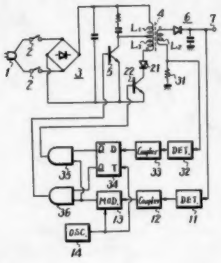
1. A switched-mode power supply for converting a d.c. input voltage into a d.c. output voltage which is substantially independent of variations in the input voltage and/or of variations of a load connected to output terminals of the power supply, said power supply comprising the series arrangement of an inductance and a controllable switch connected to input terminals for receiving the input voltage, a tuning capacitor connected in parallel with said inductance to form a resonant circuit, a control circuit having an output for providing drive switching pulses for alternately driving the switch into the conducting and the cut-off states with the duration of the conducting state of the switch being controllable in dependence upon the output voltage, and a rectifier coupled to the resonant circuit and to the output terminals for supplying the output voltage by rectification of oscillations produced during periods when the switch is cut off, the control circuit including means providing a pulse duration modulation control of the drive switching pulses followed by a control of the frequency thereof with the frequency control effected via a delay network by means of a control signal obtained from the pulse duration modulation control, the duration of the switch-off pulses having substantially a pre-determined duration which is longer than half a cycle of the resonant frequency of the resonant circuit.

4,276,587

DC TO DC CONVERTER

Akio Koizumi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 760,457, Jan. 18, 1977, abandoned. This application Aug. 16, 1978, Ser. No. 934,261
Claims priority, application Japan, Jan. 23, 1976, 6769/76
Int. Cl.² H02M *3/32*
U.S. Cl. 363—26 **7 Claims**



1. A power supply circuit comprising, a DC voltage source, a pair of input terminals connected to said DC voltage source, an output terminal, first and second inductors, a first switching means connected in series with said first and second inductors between said output terminal and one of said pair of input terminals, a second switching means connected in parallel with said second inductor, a resistor connected between the second one of said pair of input terminals and a reference potential, a first detector connected to said output terminal, an oscillator, a modulator receiving inputs from said first detector and said oscillator and supplying a switching signal to said first switching means, a second detector connected to said resistor, and a flip-flop circuit receiving inputs from said oscillator and said second detector and supplying a switching signal to said second switching means.

4,276,588

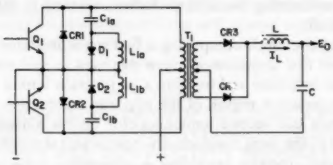
PUSH-PULL CONVERTER WITH ENERGY SAVING CIRCUIT FOR PROTECTING SWITCHING TRANSISTORS FROM PEAK POWER STRESS

W. T. McLyman, Lakewood, Calif., and Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of W. T. McLyman

Filed Jun. 22, 1979, Ser. No. 51,276
Int. Cl.³ H02H *7/12*
U.S. Cl. 363—56 **3 Claims**

1. In a circuit having a switching power transistor driving an inductive load, said transistor being switched on and off, an improved means for protecting said transistor from peak power stresses comprising a capacitor and an inductor con-

nected in a series circuit that is connected between the collector and the emitter of said transistor, said inductor being a primary winding of a transformer, and a diode in parallel with said primary winding, said diode being connected to conduct forward current to charge said capacitor while said transistor is turned off, whereby energy stored in said capacitor is automatically transferred to said primary winding when said transistor is turned on, and once said capacitor is discharged, energy stored in said primary winding is discharged through said diode, whereby energy discharged from said capacitor may be transferred to an external circuit, load or power supply for the circuit through said transformer.

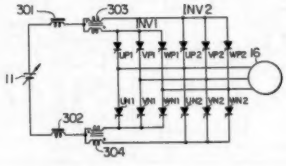


4,276,589

TWELVE-STEP CURRENT SOURCE INVERTER

Tadashi Okawa; Mitsuyuki Honbu; Yasuo Matsuda; Takanori Shibata, and Toshio Kawaguchi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 4, 1979, Ser. No. 27,098
Claims priority, application Japan, Apr. 5, 1978, 53-39219
Int. Cl.³ H02M *1/12*
U.S. Cl. 363—71 **6 Claims**



1. In a twelve-step current source inverter comprising:

(1) a first current balancing inductor for smoothing a direct current flowing thereto from a DC source;

(2) a second current balancing inductor for smoothing a direct current flowing thereto from said DC source, said second current balancing inductor having an inductance equal to that of said first current balancing inductor;

(3) a first inverter including first 1st-phase, 2nd-phase and 3rd-phase main valves which are on a positive terminal side and second 1st-phase, 2nd-phase and 3rd-phase main valves which are on a negative terminal side to form a first three-phase bridge, said first and second main valves being connected to said first current balancing inductor;

(4) a second inverter including first 1st-phase, 2nd-phase and 3rd-phase main valves which are on said positive terminal side and second 1st-phase, 2nd-phase and 3rd-phase main valves which are on said negative terminal side to form a second three-phase bridge, said main valves of said second inverter being connected to said second current balancing inductor, said second inverter having an apparent power equal to that of said first inverter;

(5) combining means for combining said first and second inverters of currents to derive a three-phase system of resultant output currents; and

(6) a control unit for applying to control gates of said positive-side and negative-side first and second main valves of said first and second inverters pulses which select the firing order thereof in the order of said 1st-phase, 2nd-phase and 3rd-phase and determine the firing intervals thereof, whereby said combining means generate stepped-waveform resultant output currents,

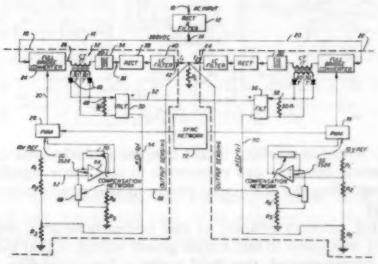
the improvement wherein said pulses sequentially applied to said control gates from said control unit are in the form of a pulse train made up of groups of pulses involving three kinds of intervals which are different in value from one another, and wherein said pulse train is made periodic, whereby each of said main valves is repeatedly fired by selected ones of said pulses having the same intervals.

4,276,590

CURRENT SHARING MODULAR POWER SYSTEM

Allen B. Hansel, Wayside, and Thiagarajan Natarajan, Orange, both of N.J., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Apr. 30, 1979, Ser. No. 35,370
Int. Cl.³ H02M *7/23*
U.S. Cl. 363—71 **10 Claims**



1. A current sharing power system having a plurality of modules connected together wherein each module comprises, in combination:

a power inverter adapted to produce an alternating current output, said power inverter being responsive to an externally produced pulse width signal to vary the width of each alternating current pulse;

current sensing circuit responsive to said alternating current pulse to produce a first current level signal to indicate the current output of the module including said current sensing circuit, said current sensing circuit including means to respond to the current level signal from each other power module coupled thereto to provide a current difference signal indicating the difference between said first current level signal and the average of all said current level signals from each other system module; and

pulse width signal producing means responsive to said difference signal to produce said pulse width signal to cause said power inverter to produce wider pulses when said current difference signal indicates said sensed current is smaller than the average of all said sensed currents from each other system module and to produce a narrower pulse when said sensed current is greater than the average of all said sensed currents from each other system module.

4,276,591

PROGRAMMABLE POWER REGULATING POWER SUPPLY

Donald L. Quick, Mountain View, Calif., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 29, 1979, Ser. No. 43,518
Int. Cl.³ H02P *13/26*
U.S. Cl. 363—92 **11 Claims**

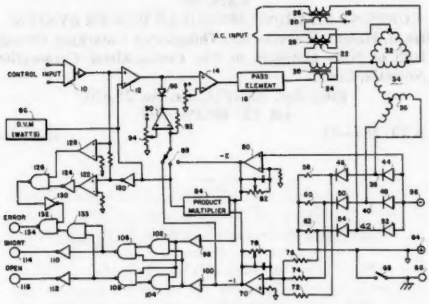
1. A power supply for generating a constant regulated power output at a level proportional to the level of an applied input control signal, said power supply comprising:

power circuitry including A.C. power input circuitry, rectification circuitry, and D.C. power output circuitry;

power measuring means coupled to said power circuitry for generating an output voltage signal proportional to the D.C. output power of the power supply;

control input circuitry responsive to external control and providing a control signal level proportional to the desired power output of said power supply;

signal comparison circuitry coupled to said power measuring means and to said control input circuitry for measuring an error signal proportional to the difference between said output power voltage signal and said control level signal;



A.C. power controlling means coupled to said signal comparison circuitry and responsive to said error signal for controlling the A.C. input power to said power circuitry and

limiting circuitry coupled to said power measuring means and responsive to said output power voltage signal and to a predetermined threshold voltage for overriding the error signal of said comparison circuitry and for controlling said A.C. power controlling means whenever said output power voltage signal exceeds said threshold voltage.

4,276,592

A-C RECTIFIER CIRCUIT FOR POWERING MONOLITHIC INTEGRATED CIRCUITS

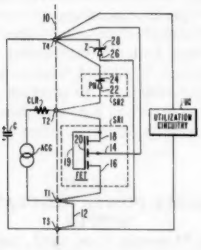
Michael B. Goldman, and George I. Morton, both of Belle Mead, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 19, 1979, Ser. No. 4,845

Claims priority, application United Kingdom, Jul. 6, 1978, 29091/78

Int. Cl.³ H02M *1/00*

U.S. Cl. 363—147 **7 Claims**



1. A rectifier circuit comprising

first and second terminals for receiving an alternating current therebetween;

a third terminal at which a rectified potential is available;

a field effect transistor having drain and source semiconductor regions of a first conductivity type disposed in a semiconductor substrate of an opposite conductivity type, said drain source regions forming pn junctions with the substrate; and further having a gate electrode;

means connecting the drain and source regions of said field effect transistor respectively to said second and first terminals, and means connecting the gate electrode to said second terminal;

means connecting the semiconductor substrate to said third terminal;

an avalanche diode comprising a first semiconductor region of said first conductivity type disposed in said semiconductor substrate and forming a pn junction with a second semiconductor region of the opposite conductivity type, wherein said second semiconductor region is disposed in and is of the same conductivity type as said semiconductor substrate, thereby providing a connection between said second semiconductor region and said semiconductor substrate; and

means connecting said first semiconductor junction to said first terminal.

4,276,593

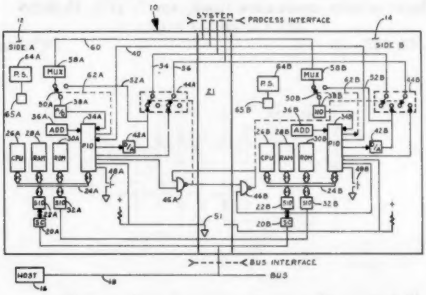
TRANSFER SYSTEM FOR MULTI-VARIABLE CONTROL UNITS

Paul L. Hansen, Brea, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 30, 1979, Ser. No. 25,515

Int. Cl.³ G06F *15/46, 15/16, 11/16*

U.S. Cl. 364—119 **11 Claims**



11. A redundant multi-variable control apparatus comprising:

a first, normally selected controller and a second, normally non-selected controller, each including means for receiving data indicative of the condition of a process to be controlled, means for performing calculations based upon such data and issuing output signals to control process variables;

output interconnect means having a first state in which said first controller controls said process variables and a second state in which said second controller controls said process variables;

self-diagnostic means contained within each of said controllers for diagnosing the proper operation of such controller and providing an output to the other controller indicating that such controller is operating properly;

means in each of said controllers generating a status signal indicating that the other controller is operating properly;

transfer means including:

(a) a first input connected to said first controller to receive a status signal indicative of the proper operation of said second controller,

(b) a second input connected to said second controller to receive a status signal indicative of the proper operation of said first controller,

(c) at least one output connected to said output interconnect means,

said transfer means serving as means for maintaining the first state of said output interconnect means when the status signals from said first and second controllers indicate that said second and first controllers, respectively, are operating properly, and for establishing the second state of said output interconnect means when the status signal from said second controller indicates that said first controller is not operating properly.

4,276,594

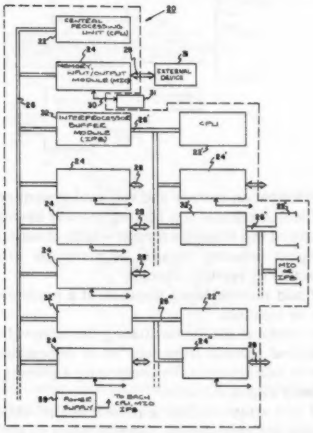
DIGITAL COMPUTER WITH MULTI-PROCESSOR CAPABILITY UTILIZING INTELLIGENT COMPOSITE MEMORY AND INPUT/OUTPUT MODULES AND METHOD FOR PERFORMING THE SAME

Richard E. Morley, Greenville, N.H., assignor to Gould Inc. Modicon Division, Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 873,018, Jan. 27, 1978, abandoned. This application Jun. 16, 1978, Ser. No. 916,274

Int. Cl.³ G06F *15/16, 13/00*

U.S. Cl. 364—200 **36 Claims**



1. A computer comprising:

(A) a central processing unit (CPU) for the processing of data, the CPU having a processor;

(B) means, connected to the CPU for providing a communication path to and from the CPU;

(C) a clock, connected to the communication path means, for generating a repetitive multi-phase clock cycle; and

(D) a composite, intelligent memory and input/output module (MIO), connected to the communication path means, so as to store and transfer data to and from the CPU and to and from external devices, the data including all application code for execution by the CPU as well as all data used in the execution of the application code, the MIO comprising:

(1) a public memory for the storage of data accessible to both the CPU and the external devices during different phases of the multiphase clock cycle,

(2) a microprocessor responsive to the phases of the multiphase clock cycle so as to control public memory access by the CPU and the external devices,

(3) a microprocessor bus connecting the public memory to the microprocessor,

(4) means, responsive to the microprocessor and connected to the microprocessor bus, for interfacing data to and from the external devices with the public memory, and

(5) means, responsive to the microprocessor and connected between the public memory and the communication path means, for interfacing data to and from the public memory and the CPU;

whereby data transfer to and from the public memory of the MIO to the communication path means occurs during a distinct phase of the clock cycle and the transfer of data to and from the public memory of the MIO with the external devices occurs during another distinct phase of the clock cycle.

4,276,595

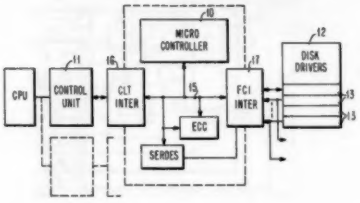
MICROINSTRUCTION STORAGE UNITS EMPLOYING PARTIAL ADDRESS GENERATORS

David A. Brereton, and Buddy F. Stansbury, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1978, Ser. No. 921,147

Int. Cl.² G06F *13/00*

U.S. Cl. 364—200 **14 Claims**



1. A microcontroller for executing branch, conditional branch and non-branch type of instructions in a fixed time machine cycle while simultaneously fetching the next instruction, comprising:

A. means for storing a plurality of instructions at individually addressable storage locations and for reading an instruction therefrom;

B. an instruction decoder having its input connected to said means for storing and a load instruction decoder control terminal;

C. means for addressing said means for storing including:

1. an address register;

2. a plurality of partial address generators, one of said partial address generators comprising:

a. a first register;

b. a plurality of instruction addressable data sources; and

c. means for selectively connecting one of said data sources to the input of said first register;

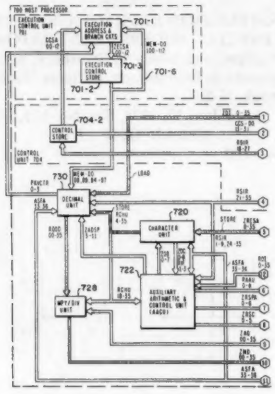
3. gating means for selectively connecting each said generator to said address register to permit a partial address from at least one selected said generator to be transferred to said address register prior to a first predetermined time in said machine cycle; and

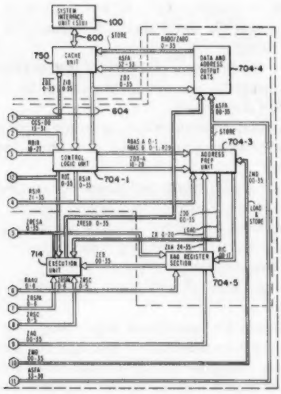
D. control means having an input connected to said decoder and its output connected to said means for addressing, said means for storing, and said control terminal and operable in response to the contents of said decoder during each machine cycle to selectively transfer the contents of one selected said data source into said first register immediately after the start of each machine cycle, to selectively transfer prior to said first predetermined time partial address signals from one or more of said partial address generators to said address register, to initiate at said predetermined time the reading of said next instruction from said means for storing to said decoder input, and to supply a load signal to said decoder at the end of said cycle whereby the next instruction to be executed is transferring to said decoder while the current instruction is being executed and is loaded into said decoder immediately prior to the termination of said current machine cycle.

4,276,596
SHORT OPERAND ALIGNMENT AND MERGE OPERATION

Richard T. Flynn, Peoria, and Jerry L. Kindell, Glendale, both of Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 2, 1979, Ser. No. 401
Int. Cl.³ G06F 7/38
U.S. Cl. 364—200 **12 Claims**





11. The system of claim **10** wherein said selection means is operative for selecting signals indicative of said word comprising numeric zero digits in response to said shift count signals and said send count signals being coded to specify a number whose value is greater than or equal to a first predetermined value;

wherein said selection means is further operative for selecting signals indicative of said second word in response to said send count signals being coded to specify a number whose value is equal to a second predetermined number;

wherein said selection means is further operative for selecting signals indicative of said first and said second words in response to said shift count signals and being coded to specify a number whose value is equal to a third predetermined number;

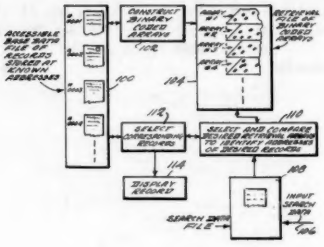
wherein said selection means is further operative for selecting signals indicative of said first word in response to said shift count signals and said send count signals being coded to specify a number whose value is equal to a fourth predetermined number;

wherein said selection means is further operative for selecting signals indicative of said word comprising numeric zero digits in response to said shift count signals and said send count signals being coded to specify a number whose value is less than said fourth predetermined number.

4,276,597
METHOD AND APPARATUS FOR INFORMATION STORAGE AND RETRIEVAL

Donald D. Dissly, and Ronald J. Blanchard, both of Louisville, Ky., assignors to Volt Delta Resources, Inc., New York, N.Y.

Filed Jan. 17, 1974, Ser. No. 434,207
Int. Cl.³ G06F 3/00, 7/10
U.S. Cl. 364—300 **80 Claims**



1. An information storage and retrieval system comprising:

a set of stored information bearing records having information stored in a language format which, at least in part, has intelligent meaning because of particular groupings of characters or symbols therein,

each of said records being disposed at a predetermined address or location,

a stored retrieval file for facilitating the retrieval of particular desired records from said set of information bearing records, said retrieval file comprising a plurality of arrays of binary coded elements,

each of said arrays including predetermined elements individually and respectively corresponding to the addresses of each of said information bearing records,

each of said arrays being formed to indicate the presence or absence of a predetermined identifiable characteristic of the language structure associated with the information content of each of said information bearing records, wherein said plurality of arrays constituting a comprehensive set of arrays correspond to a comprehensive set of said predetermined identifiable characteristics of language structure comprising substantially all such predetermined identifiable characteristics which are to be later utilized in searching for desired information bearing records, and

each element in a given array being binary coded in a first manner to represent the presence in the respectively corresponding record of the predetermined identifiable characteristic of language structure corresponding to the given array and being binary coded in a second distinguishable manner to represent the absence in the respectively corresponding record of the predetermined identifiable characteristic of language structure corresponding to the given array

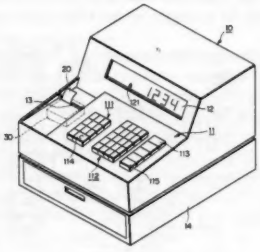
whereby particular desired records bearing certain desired information may be located and thus retrieved by first determining the subset of said predetermined identifiable characteristics present in said desired information and then examining the respectively corresponding subset of said arrays to determine the storage address or location of each stored record containing all of said subset of predetermined identifiable characteristics.

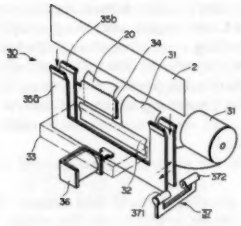
4,276,598

ELECTRONIC CASH REGISTER INCLUDING MEANS FOR PRODUCING PRINTED VALIDATION DATA

Haruhiko Inoue, Nagaokakyo, and Syuji Nakano, Osaka, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Sep. 19, 1979, Ser. No. 77,145
Claims priority, application Japan, Dec. 1, 1978, 53-149410
Int. Cl.[3] G06F 3/12
U.S. Cl. 364—405 8 Claims





1. An electronic cash register including a printing member for printing data on paper comprising:

a setting means for presetting a validation printing operation request when said electronic cash register is required to produce a validation print of predetermined processed data;

a receiving means for receiving a validation paper to be printed by said printing member with said predetermined processed data;

a detecting means coupled to said receiving means for generating a validation paper presence signal when said validation paper is present in said receiving means;

an instructing means for generating an instruction signal instructing the printing of said predetermined processed data on said validation paper by said printing member; and,

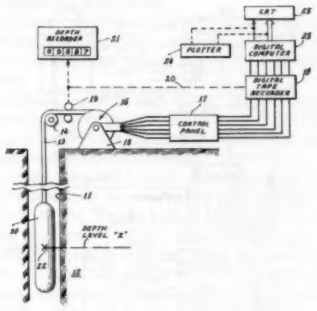
a control means responsive to said setting means, said instructing means, and said detecting means for operating said printing member to print said predetermined processed data on said validation paper, said control means generating an enable signal placing said control means in a mode for printing said processed data when said setting means has been preset with a validation printing operation request and a predetermined cash register function corresponding to said processed data has been completed in said electronic cash register, said control means causing printing of said processed data by said printing member upon generation of said enable signal and in response to said presence signal from said detecting means and said instruction signal from said instructing means.

4,276,599

METHOD OF PROCESSING WELL LOGGING DATA

James J. Maricelli, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 276,348, Jul. 31, 1972, abandoned. This application Jun. 22, 1979, Ser. No. 51,018
Int. Cl.[3] G01V 3/32, 3/38
U.S. Cl. 364—422 17 Claims



1. A well logging method of producing a single record containing two or more adjacent and mutually registered traces showing the respective degrees of mutual fit, at two or more respective adjacent depth levels in an earth formation, of a plurality of well logs separately taken in one or more boreholes in the formation, each respective trace showing the degree of mutual fit of the logs at the respective depth level when respective portions of the logs are depth displaced relative to each other over a respective depth interval at selected displacement steps, comprising the following machine implemented steps:

deriving a first and a second well log separately taken in one or more boreholes in the earth formation;

finding the degree of mutual fit between the first and the second well log at a first selected depth level in the formation when respective portions of the logs are depth displaced relative to each other over a respective first depth interval at selected displacement steps;

finding the degree of mutual fit between the first and the second log at a second selected depth level, adjacent to the first selected depth level, when respective portions of the logs are depth displaced relative to each other over a respective second depth interval at selected displacement steps;

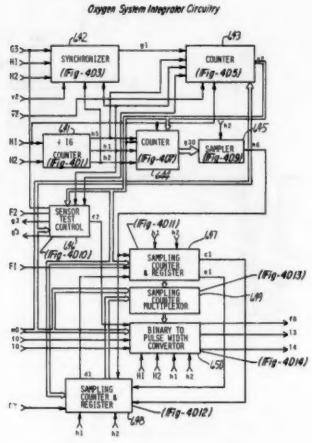
producing a first trace showing the degree of fit found at the first depth level and a second trace showing the degree of fit found at the second depth level, and forming the first and the second trace on a single record adjacent to each other and in mutual registration with each other, said single record of the first and the second trace indicating and emphasizing the correct relative depth displacement between the first and the second log for best mutual fit between the logs and de-emphasizing any spurious indications of best fit at other relative depth displacements between the logs.

4,276,600

OXYGEN SENSOR FEEDBACK LOOP DIGITAL ELECTRONIC SIGNAL INTEGRATOR FOR INTERNAL COMBUSTION ENGINE CONTROL

Thomas W. Hartford, Livonia, and James A. Kessler, Troy, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Feb. 27, 1978, Ser. No. 881,981
Int. Cl.³ F02M 51/00; F02D 28/00; F02B 75/10
U.S. Cl. 364—431 11 Claims



1. In an internal combustion engine having an intake system, an exhaust system, an engine block, a plurality of cylinders disposed in the engine block, a piston mounted for reciprocal movement within each of the plurality of cylinders, means responsive to output control signals for controlling the quantity of fuel supplied to a selected one or more of the plurality of cylinders and the ignition of the fuel within the cylinders, the improvement comprising:

a microprocessor means including a memory means for storing a plurality of look-up tables of control values and one or more programmed control laws, said microprocessor means being responsive to data indicative of the actual measured value of various engine-operating parameters for implementing said control laws to compute one or more commands for generating the control signals;

oxygen sensing means disposed in said exhaust system for monitoring the air-fuel ratio existing in the cylinders and generating a sensor output signal indicative thereof, said sensor output signal having a first value if said air-fuel ratio is "rich" and a second value if said air-fuel ratio is not rich;

means for sampling said sensor output signal a predetermined number of times per engine period and temporarily storing an indication of the sampled values of said sensor output signal and;

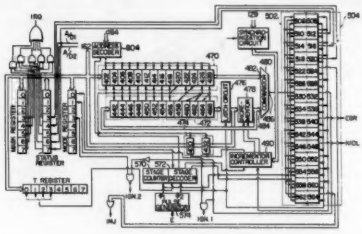
means for counting the temporarily stored oxygen sensor sampled values by digital means and storing a digital count value indicative thereof until said digital count value is requested by said microprocessor means for use in implementing one or more of said pre-programmed control laws to compute one or more of said commands.

4,276,601

ELECTRONIC ENGINE CONTROL APPARATUS

Hiroatsu Tokuda, Katsuta; Shigeki Morinaga, Hitachi, and Hideo Nakamura, Hinodemachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 20, 1978, Ser. No. 943,930
Claims priority, application Japan, Sep. 21, 1977, 52-114048; Oct. 17, 1977, 52-124261; Oct. 19, 1977, 52-125972; Oct. 19, 1977, 52-125982
Int. Cl.³ F02D 5/00; F02P 5/04; G05B 15/02
U.S. Cl. 364—431 53 Claims



1. For use in a processor-controlled apparatus for controlling the operation of an internal combustion engine for which a plurality of sensors produce signals representative of operating conditions of said engine and being coupled to actuator means for controlling respective energy conversion functions of said engine in response to control signals applied thereto;

an improved control apparatus comprising, in combination:

first means for generating an engine control timing signal pattern through which operational events of said engine are controlled;

second means for storing engine control codes coupled thereto;

third means, coupled to said first means, for generating respective engine timing codes the values of which are selectively modified by said engine control timing pattern;

fourth means, coupled to said second and third means, for comparing respective ones of said engine control codes with respective ones of said engine timing codes and producing respective output signals when said respective engine control codes define a prescribed relationship with respect to said engine timing codes; and

fifth means, coupled to said fourth means, for producing control signals to be coupled to said actuator means in response to the output signals produced by said fourth means.

38. For use in a processor-controlled apparatus for controlling the operation of an internal combustion engine having an output shaft driven by mechanical energy converted from heat energy released by the combustion of fuel, said engine including igniting means for igniting the fuel to generate heat energy in accordance with conditions of said engine, said igniting means initiating the charging of ignition energy at energy charging timing and igniting the fuel at ignition timing, and for which a plurality of sensors produce signals representative of operating conditions of the engine and having digital converting means for converting the outputs of the sensors into corresponding digital signals;

a control apparatus for generating output pulses to drive said igniting means in accordance with the digital outputs of said processor,

said control apparatus comprising, in combination:

stage signal generating means for repetitively generating at least first and second stage signals corresponding to prescribed engine timing operations,

a first plurality of registers including at least first and second registers coupled to said stage signal generating means, said first register storing outputs of said processor defining

said charging timing and selected in response to said first stage signals for providing stored data, said second register storing the output of said processor defining said ignition timing and selected in response to said second stage signal for providing stored data,

counter means including at least first and second counters for storing respective codes representative of the instantaneous condition of said igniting means and coupled to said stage signal generating mans, said first counter being selected in response to said first stage signal, said second counter being selected in response to said second stage signal,

a comparator for comparing the contents of a selected one of said first plurality of registers with the contents of a selected one of said second plurality of registers, and

output means including a plurality of storage means for storing the outputs of said comparator and delivering the output to the igniting means, said output means being coupled to the stage signal generating means and to one of said storage means being selected in response to a stage signal for receiving an output of said comparator.

4,276,602

ELECTRONIC ENGINE CONTROL APPARATUS HAVING ARRANGEMENT FOR VARYING FUEL INJECTION DURATION

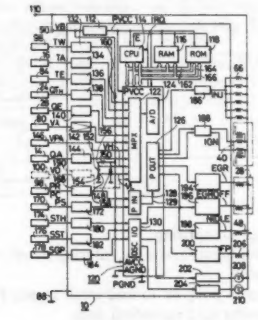
Sanshiro Obara; Hiroatsu Tokuda; Akihiko Konno, all of Ibaraki, and Hideo Nakamura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

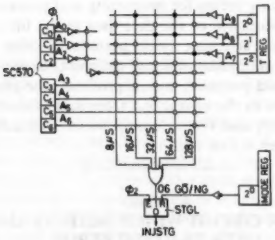
Filed Jul. 19, 1979, Ser. No. 59,029

Claims priority, application Japan, Aug. 7, 1978, 53-95483

Int. Cl.³ F02D *5/00;* **F02P** *5/04;* **G05B** *15/02*

U.S. Cl. 364—431 **45 Claims**





1. In a control apparatus for an internal combustion engine having:

sensor means for producing signals representative of operating conditions of said engine;

actuator means for controlling respective energy conversion functions of said engine in response to control signals applied thereto;

an input/output unit coupled to receive signals produced by said sensor means and to deliver control signals to said actuator means; and

a data processing unit, coupled to said input/output unit, for carrying out engine control data processing operations in accordance with signals produced by said sensor means and thereby generating engine control codes that are coupled to said input/output unit;

said input/output unit comprising:

first means for generating an engine control timing signal pattern through which respective operational events of said engine are controlled;

second means, coupled to said first means, for generating respective engine timing codes the values of which are selectively modified by said engine control timing signal pattern;

third means, coupled to said second means, for producing respective output signals when said respective engine timing codes define a prescribed relationship with respect to said engine control codes;

fourth means, coupled to said third means, for producing control signals to be coupled to said actuator means in response to the output signals produced by said third means; and

fifth means, coupled to said first means, for varying a characteristic of said engine control timing signal pattern in response to instruction data supplied by said data processing unit.

4,276,603

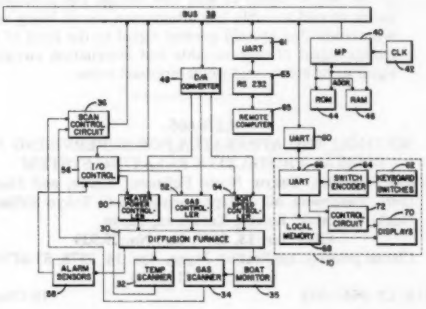
DIFFUSION FURNACE MICROCONTROLLER

Martin A. Beck, South Londonderry, Vt.; John H. Fabricius, Tyngsboro, Mass., and Donald G. Landis, Milford, N.H., assignors to BTU Engineering Corporation, North Billerica, Mass.

Filed Oct. 30, 1979, Ser. No. 89,631

Int. Cl.³ G06F *15/46;* **G05B** *23/30*

U.S. Cl. 364—477 **21 Claims**



19. A diffusion furnace control system comprising:

one or more temperature sensors in the diffusion tube of the diffusion furnace and operative to monitor the temperature of respective process zones along the tube;

one or more temperature sensors disposed at the heaters of the furnace and operative to monitor the temperature of the heaters for each furnace zone;

first control means coupled to the tube temperature sensors and operative to measure the deviation of temperature in each zone of the tube from the set point temperature for each zone;

means for determining whether the set points should be adjusted; and

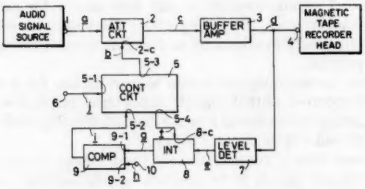
second control means operative in response to a determina-

tion that set point should be adjusted to control power to the heaters to provide an intended set point for each process zone.

4,276,604
AUTOMATIC ATTENUATION CIRCUIT

Masatsugu Kitamura; Hideo Onoye, and Masami Yamazaki, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed May 23, 1979, Ser. No. 41,820
Claims priority, application Japan, May 28, 1978, 53-63610
Int. Cl.³ H03G 3/20
U.S. Cl. 364—480 **9 Claims**

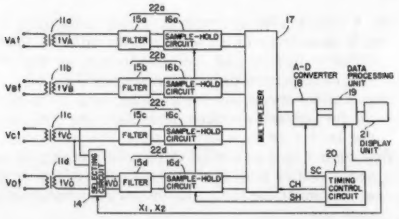


1. An automatic attenuation circuit comprising:
(a) a variable loss attenuation circuit for attenuating the level of an input signal;
(b) first means for detecting the level of the output signal of said variable loss attenuation circuit, said first means producing a signal when the magnitude of the variable loss attenuation circuit output signal is above a predetermined value, said first means having a level detector responsive to the output signal of said variable loss attenuation circuit for producing an analog signal indicative of the magnitude of said output signal, an integrator responsive to said analog signal from said level detector, means for resetting said integrator periodically to a predetermined level, and a comparator responsive to the output voltage of said integrator for detecting the level of said voltage relative to said predetermined voltage; and
(c) second means for producing a control signal in response to the output signal of said first means, the attenuation factor of said variable loss attenuation circuit being stepwise controlled by said control signal so the level of the output signal of said variable loss attenuation circuit is equal to or below said predetermined value.

4,276,605
METHOD AND APPARATUS FOR SUPERVISING A DIGITAL PROTECTIVE RELAYING SYSTEM

Eiichi Okamoto, Tokyo; Norio Fujisawa, Fuchu, and Masao Hori, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Apr. 13, 1979, Ser. No. 29,939
Claims priority, application Japan, Apr. 18, 1978, 53-44767
Int. Cl.³ H02H 3/36
U.S. Cl. 364—483 **10 Claims**

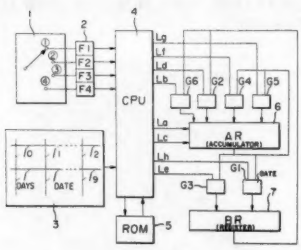


1. In a method for supervising a digital protective relaying system for protecting an electric power system wherein a first type of electrical quantities in the electric power system, each having a certain magnitude, are detected by detecting means and digitized by respective first input circuits and a second type of electrical quantity in the electric power system which is normally substantially zero is detected by detecting means and digitized by a second input circuit, and the outputs of said first input circuits are arithmetically operated on in a data processing unit to check whether there is a fault in the first input circuits, the improvement which comprises: inputting, into the second input circuit, one of said first type of electrical quantities in place of said second type of electrical quantity, and performing an arithmetical operation in the data processing unit on the output of said second input circuit and the outputs of said first input circuits except for that one of said first input circuits which normally receives said one of said first type of electrical quantities to check whether there is a fault in said second input circuit.

4,276,606
DATE DATA COMPUTER

Isao Harigaya, Yokohama, and Akihiro Yamataka, Funabashi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 7 77,828, Mar. 15, 1977, Pat. No. 4,149,261.
This application Jan. 26, 1979, Ser. No. 6,751
Claims priority, application Japan, Mar. 19, 1976, 51-30488; Mar. 23, 1976, 51-31862; Apr. 26, 1976, 51-47511
Int. Cl.³ G06F 7/38
U.S. Cl. 364—709 **7 Claims**



1. A computer comprising:
numerical data input means for entering numerical data into the computer;
processor means coupled to said input means for receiving and processing said numerical data;
first selecting means for instructing said processor means that the data entered is date data; and
second selecting means for instructing said processor means as to the sequence of the date data at the time of entry, wherein said selecting means permits selection of one of plurality of predetermined different sequences, and wherein said processor means processes the entered data in response to the instruction from said second selecting means when said first selecting means instructs that the data entered is date data.

4,276,607
MULTIPLIER CIRCUIT WHICH DETECTS AND SKIPS OVER TRAILING ZEROS

Wilson T. Wong, Anaheim, Calif., assignor to Sperry Rand Corporation, New York, N.Y.

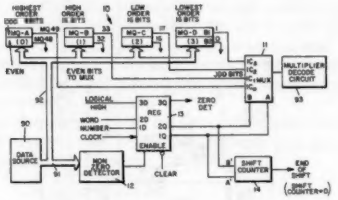
Filed Apr. 9, 1979, Ser. No. 28,214
Int. Cl.³ G06F 7/52
U.S. Cl. 364—760 **16 Claims**

1. A multiplier circuit comprising,

register means for storing the bits of a number to be multiplied,

decoder means connected to receive bits from said register means to produce an output signal representative of said number to be multiplied,

detector means for operating on said number to be multiplied to detect the presence of a non-zero bit in said number,



control register means connected to said decoder means for indicating the presence of a non-zero bit in said number to be multiplied when said control register means is enabled by a signal from said detector means as the result of detecting a non-zero bit, and

shift counter-means connected to said control register means for controlling the number of shifts to be performed during the multiplication process as a function of a signal from said control register means.

4,276,608

FIBONACCI P-CODE PARALLEL ADDER

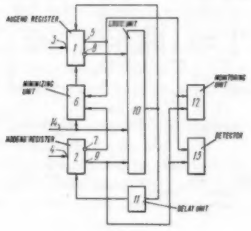
Alexei P. Stakhov, prospekt Kosmonavtov 54, kv. 130; Nikolai A. Solyanichenko, ulitsa Vasilia Porika 30, kv. 108; Vladimir A. Luzheisky, ulitsa Vasilia Porika, 30, kv. 108; Alexandr V. Ovodenko, ulitsa 600-letia, 44/75, kv. 16, and Andrei A. Kozak, prospekt Leninskogo Komsomola 53, kv. 40, all of Vinnitsa, U.S.S.R.

Filed May 14, 1979, Ser. No. 38,930

Claims priority, application U.S.S.R., May 15, 1978, 2617011

Int. Cl.³ G06F *7/49*

U.S. Cl. 364—768 **1 Claim**



1. A Fibonacci p-code parallel adder comprising:

an n-digit augend register and an n-digit addend register each having an original code write input to receive respectively an augend and an addend represented in Fibonacci p-codes, an ith bit position of said n bit positions of each of said registers comprising at least a flip-flop having a reset input, a complement output, a set input and a true output, said set inputs of said bit positions of said registers being used as said original code write inputs;

a logic unit comprising n rewrite AND gates, an ith gate of said rewrite AND gates having three inputs and an output, first and second inputs of said ith rewrite AND gate being coupled respectively to said complement output of said ith bit position of said augend register and to said true output of said ith bit position of said addend register to provide for analyzing the condition of said flip-flops of said ith bit positions of said augend and addend registers;

a delay unit comprising n delays, said output of said ith rewrite AND gate being coupled to said set input of said ith bit position of said augend register and to said reset input of said ith bit position of said addend register via a respective delay to transfer a 1 from said ith bit bit position of said addend register to said ith bit position, containing a 0, of said augend register;

a Fibonacci p-code minimizing unit having two data inputs, a control input, and a normalize signal output, first and second data inputs of said Fibonacci p-code minimizing unit coupled respectively to said true outputs of said bit positions of said augend register and to said complement outputs of said bit positions of said addend register to provide for analyzing the codewords contained in said registers, said output of said Fibonacci p-code minimizing unit being coupled to a normalize signal input of said augend register to provide for the reduction, to the minimal form, of the codeword stored in said augend register and representing a sum code of the augend and addend;

an end-of-addition detector having inputs coupled to said set outputs of said bit positions of said augend and addend registers, and having an output which produces an end-of-addition signal when the addend register contains a zero code and the augend register contains a sum code represented in the minimal form of a Fibonacci p-code; and

a monitoring unit having inputs coupled to said true outputs of said bit positions of said augend and addend registers, and having an output which produces an error indicating signal when the form of the codeword contained in said augend register differs from the minimal form; wherein

control inputs of said Fibonacci p-code minimizing unit and said logic unit are coupled to a control bus of the adder, and n is the length of the Fibonacci p-code and i=0,1,2 . . . , n−1.

4,276,609

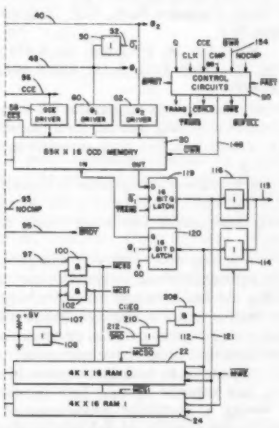
CCD MEMORY RETRIEVAL SYSTEM

Narendra M. Patel, San Antonio, Tex., assignor to NCR Corporation, Dayton, Ohio

Filed Jan. 4, 1979, Ser. No. 1,034

Int. Cl.³ G06F *13/00*; G11C *9/06*

U.S. Cl. 364—900 **7 Claims**



1. A memory system for use in a data processing system in which a central processor generates a sequence of requested read and write instructions including the address of the data to be accessed over a common bus, said system comprising:

a first operating main memory unit coupled to said common

bus for storing data to be accessed by the central processor over said common bus;

a plurality of buffer memory units each having a higher operational speed than said first main memory unit and coupled to said main memory unit and the common bus for storing a portion of the data stored in said main memory unit;

an address register for each of said buffer memory units coupled to the common bus for storing the addresses of the data stored in an associated buffer memory unit;

comparison means for each of said buffer memory units coupled to the common bus and the address registers of an associated buffer memory unit for comparing the address of the requested data appearing on the common bus with the addresses stored in its coupled address register for outputting a first control signal upon finding a coincidence in one of said buffer memory units and a second control signal upon finding no coincidence in any of the buffer memory units;

a first bi-stable means coupled to the output of each of said comparision means, said common bus and said address registers for outputting a first memory enabling signal in response to the generation of said first control signal enabling the buffer memory unit in which the coincidence was found to be accessed by the address of the requested data appearing on the common bus, and enabling said address registers to store the address of the data written into said buffer memory units, said first bi-stable means being further operated in response to said second control signal and to the generation of the next sequential read and write instruction to output said first memory enabling signal to the buffer unit not previously accessed thereby enabling said buffer unit to receive the requested data from the main memory unit for storage therein;

and a second bi-stable means coupled to the output of each of said comparison means for outputting a third control signal in response to the generation of said second control signal, said system further including a third bi-stable means coupled to the output of said second bi-stable means for outputting a fourth control signal initiating the transfer of the requested data from the main memory unit to one of said buffer memory units in response to receiving said third control signal.

4,276,610
PROGRAMMABLE SEQUENCER APPARATUS

William C. Fleck, Palisades Park, N.J., assignor to Intraspec Inc., Bogota, N.J.

Filed Jan. 26, 1979, Ser. No. 6,576

Int. Cl.³ G06F *3/03, 3/153;* G05B *19/10*

U.S. Cl. 364—900 **7 Claims**

1. Programmable sequencer apparatus for selectively establishing sequential energizing patterns for a plurality of outputs in response to stored data, said programmable sequencer apparatus comprising:

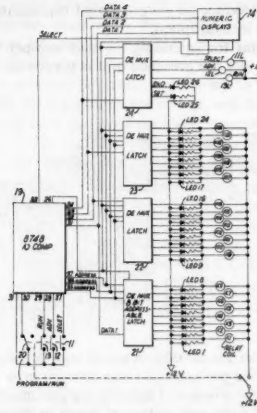
a plurality of selectively energizable indicating means, each of said plurality of outputs having one of said plurality of selectively energizable indicating means corresponding thereto;

means for energizing said selectively energizable indicating means in a predetermined progressive sequence;

first operator actuatable means for selectively interrupting said progressive sequence and for subsequently continuing said progressive sequence toward a completion of a particular predetermined progressive sequence;

first means responsive to each interruption in said progressive sequence initiated by said first operator actuatable means during a particular predetermined progressive sequence for temporarily storing data corresponding to a one of said plurality of selectively energizable indicating means energized during the occurrence of said interruption;

second operator actuatable means for indicating that temporarily stored data for a particular predetermined progressive sequence is representative of a selected energizing pattern in a sequence of energizing patterns; and



second means responsive to said second operator actuatable means for storing said temporarily stored data as an ordered step within a series of steps being established to represent said sequence of energizing patterns.

4,276,611
DEVICE FOR THE CONTROL OF DATA FLOWS

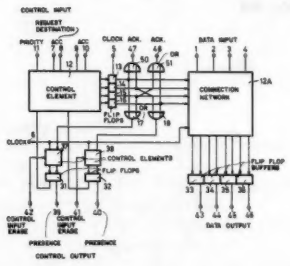
Pierre G. Jansen, and Jozef L. W. Kessels, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 815,256, Jul. 13, 1977, abandoned. This application Apr. 16, 1979, Ser. No. 30,248

Claims priority, application Netherlands, Jul. 23, 1976, 7608165

Int. Cl.³ G06F *3/00*

U.S. Cl. 364—900 **17 Claims**



1. A device for the control of data flows having at least a first and a second data input path and at least a first and a second data output path comprising:

a connection network having input connections to said data input paths and output connections to said data output paths;

each of said paths having at least two data lines in parallel;

a control unit having a control output connected to said connection network capable of establishing therein under control of respective signals a blocking of all connections in said connection network between any of said data input lines and any of said data output lines under a first set of prescribed conditions, a connection between a predetermined one of said data input lines and a predetermined one of said data output lines under a second set of prescribed

conditions, and at least two difference connections between predetermined data input lines and predetermined data output lines under a third set of prescribed conditions;

a logic network connected to said control output for the selective generation, in association with a controlled connection direction from a data input line, of a copy acknowledge signal for the relevant data input line;

said control unit further including means for receiving destination signals for each data input for the control of connection directions in said connection network; and

said distination signals comprising a request signal for data to be transferred (copy request) and a destination identifier for one of said output lines

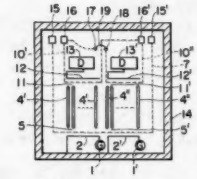
a separate data output buffer for each data output path connected between said connection network and said data output path.

4,276,612

MAGNETIC BUBBLE MEMORY DEVICE WITH DIVIDED ELECTRICAL CONDUCTORS

Ryo Suzuki, Kokubunji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 22, 1979, Ser. No. 51,145
Claims priority, application Japan, Jul. 5, 1978, 53-80903
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—12 **7 Claims**



7. A magnetic bubble memory device comprising a layer of a material in which magnetic bubbles representative of information can be moved in response to a rotating magnetic field, a plurality of minor loops which serve to circulate the magnetic bubbles in said layer, a major line which is located in proximity to, and spaced from, one end of said each minor loop in order to read out the information from said minor loops, gates which are disposed between the respective minor loops and said major line and which have at least a replicating function,

current pulse generator means for generating a current pulse on a pair of output terminals, and

plural conductors connected to said output terminals in parallel to apply simultaneously the current pulse generated by said current pulse generator to drive said gates.

4,276,613

CLOSE-PACKED BUBBLE PROPAGATION DEVICE

Byron R. Brown, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 23, 1978, Ser. No. 954,132
Int. Cl.³ G11C *13/08*
U.S. Cl. 365—14 **11 Claims**

1. A close-packed magnetic bubble device comprising

a plurality of first, second and third propagation elements, said first, second and third elements being spaced to provide a period of less than three bubble diameters;

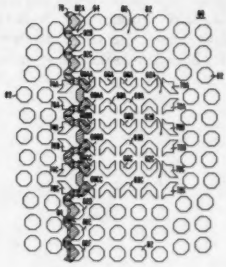
at least two first storage loops containing said first, second and third elements;

a second storage loop consisting of a part of said first loop and containing said second and third elements;

a first access path in said first loops containing said first and second elements;

means for applying an in-plane rotating field to said elements; and

switch means associated with said first and second elements wherein the activation of said switch means and the application of an in-plane rotating field to said elements causes bubbles associated with both first and second elements to



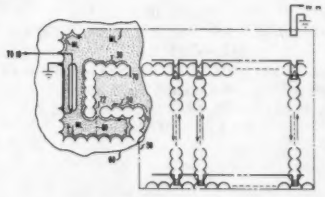
propagate along said access path and bubbles associated with second and third elements to propagate around said second storage loops and wherein non-activation of said switch means and the application of an in-plane rotating field to said elements causes bubbles to propagate around said first storage loops.

4,276,614

ION-IMPLANTED MAGNETIC BUBBLE MEMORY WITH MERGE PORT

Terence J. Nelson, and Raymond Wolfe, both of New Providence, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 3, 1979, Ser. No. 99,556
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—36 **4 Claims**



1. A magnetic bubble memory comprising a host layer of magnetic material having a three fold axes of symmetry in which magnetic bubbles can be moved along first, second, and third paths in response to a magnetic field reorienting in the plane of said layer, a pattern of nonimplanted regions in said host layer for defining said paths in implanted regions thereabout, said nonimplanted regions defining first and second contiguous sets of periodic elements and an implanted gap separating said sets, said gap having an axis aligned with one of said axis of symmetry for moving bubbles from said first and second to said third paths.

4,276,615

ANALOG READ-ONLY MEMORY SYSTEM FOR ANTILOG CONVERSION

Donald S. Kuhnel, Houston, Tex., assignor to Graphic Arts Manufacturing Company, Houston, Tex.

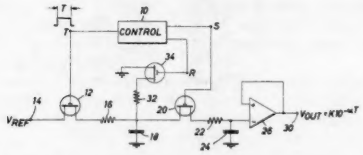
Filed Sep. 28, 1979, Ser. No. 79,888
Int. Cl.³ G11C *13/00*
U.S. Cl. 365—45 **11 Claims**

1. An analog read-only memory system for obtaining an

antilog relationship between an input signal and an output signal, comprising:

analog means for providing an exponential-type memory signal varying as a function of time from a preselected initial voltage toward a preselected reference voltage, said analog means including a capacitor, a first resistor for charging said capacitor with a first time constant providing said exponential-type memory, and a second resistor for discharging said capacitor at a second time constant;

first switch means connecting said capacitor with said second resistor for initializing said analog means at said initial voltage;



second switch means for connecting said capacitor to said reference voltage through said first resistor at a first time and for disconnecting said capacitor from said reference voltage at a second time, the voltage on said capacitor forming said memory signal; and

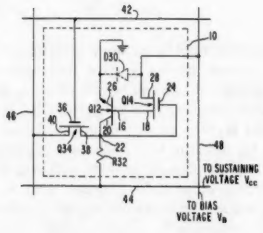
control means for generating a plurality of control signals, including signals for activating said second switch means at said first and second times, respectively, the difference between said first and second times being linearly related to said input signal.

4,276,616

MERGED BIPOLAR/FIELD-EFFECT BISTABLE MEMORY CELL

Falke Hennig, Monta Vista, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Apr. 23, 1979, Ser. No. 32,045
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—177 **15 Claims**



15. A memory cell comprising:

a bipolar transistor having a first emitter/collector, a base, and a second emitter/collector, said cell being bistable, a first stable state existing in said cell when said bipolar transistor is conducting and a second stable state existing in said cell when said bipolar transistor is substantially not conducting; and

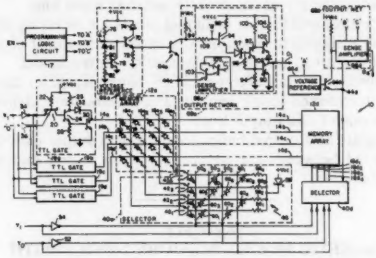
a field-effect transistor having a source, a gate electrode, and a drain, said base integral with said drain and said second emitter/collector coupled to said gate electrode.

4,276,617

TRANSISTOR SWITCHING CIRCUITRY

Hiep T. Le, Sunnyvale, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Jun. 28, 1979, Ser. No. 53,125
Int. Cl.³ G11C *7/00*
U.S. Cl. 365—189 **14 Claims**



1. An electronic circuit, comprising:

(a) selector means for electrically coupling one of a plurality of conductors to a common terminal selectively in accordance with a control signal, including means for producing a voltage at such common terminal related to current flow through the selectively coupled one of the electrical conductors;

(b) an output network; and

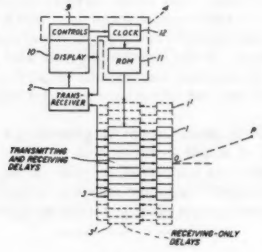
(c) a transistor having a pair of electrodes serially connected between the common terminal and the output network.

4,276,618

MAPPING SYSTEMS

Ian M. Green, Buckie, Scotland, assignor to E M I Limited, Hayes, England

Filed May 11, 1979, Ser. No. 38,053
Claims priority, application United Kingdom, May 25, 1978, 22289/78
Int. Cl.³ G01S *15/89*
U.S. Cl. 367—11 **11 Claims**



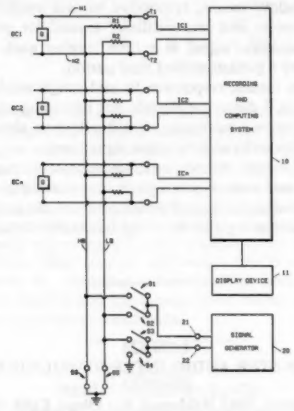
1. A method of operating an apparatus, for surveying a region, the apparatus including transmitter means capable of transmitting energy along a plurality of paths lying radially in a sector of a circle and receiver means capable of being focussed on positions in said region to receive energy reflected therein, the method being suitable to provide echo data, for individual ones of a plurality of positions in said region, suitable for display on a raster of scanned lines in a display apparatus, and including the steps of defining a plurality of said positions disposed on a cartesian matrix notionally defined in said region such that lines of said positions correspond to said scanned lines of said display arrangement; directing the transmitted energy into the region along a plurality of said radial paths such that each path is of sufficient width to intercept a plurality of said positions; focussing the receiver means in

sequence on each of the plurality of positions intercepted by one of said paths to receive energy reflected therein; and repeating the preceding step for the other said paths.

4,276,619
IMPEDANCE AND COMMON MODE REJECTION TESTING OF A MULTI-CHANNEL SEISMIC DATA GATHERING APPARATUS

James E. Rickenbacker, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Mar. 7, 1979, Ser. No. 17,999
Int. Cl.³ G01V 1/16; G01C 27/00
U.S. Cl. 367—13 **3 Claims**



1. A seismic data gathering apparatus including:

a signal recording and computing system, said system having a plurality of input channels;

a plurality of geophone channels, each geophone channel having one or more geophones and a pair of wires, one high and one low, each wire being connected to the geophones and to an input channel of the recording and computing system, so that the voltage across each pair of wires is transmitted to said system;

a high bus;

an impedance for each high wire, said impedance being coupled to the high bus and to its high wire between the geophones and the recording and computing system;

a low bus;

an impedance for each low wire, said impedance being coupled to the low bus and to its low wire between the geophones and the recording and computing system;

a signal generator for producing a test signal, said generator having a high output terminal and a low output terminal;

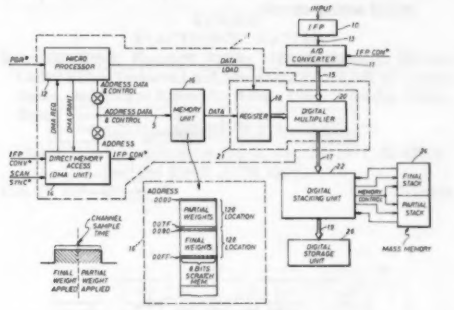
switching means for selectively controlling the connections between the buses, the generator and ground, the switching means having a first setting connecting both buses to ground and disconnecting both buses from the generator, the switching means having a second setting disconnecting the buses from ground and connecting them to different output terminals of the generator so that the test signal is applied to the geophone channels substantially simultaneously, and the switching means having a third setting disconnecting both buses from ground and connecting them to one of the output terminals of the generator and connecting the other output terminal of the generator to ground,

whereby the first setting will transmit the seismic signals developed by the geophones to the recording and computing system and the second setting will transmit signals indicative of the impedances of the geophone channels to the system and the third setting will transmit signals indicative of the common mode rejection of the geophone channels to the system.

4,276,620
METHOD AND APPARATUS FOR OBTAINING A COMPOSITE FIELD RESPONSE TO A VARIABLE SOURCE ARRAY USING WEIGHTING COEFFICIENTS

Twassul A. Kahn, Cypress; John W. Kiowski, Houston, and Douglas G. Lang, Bellaire, all of Tex., assignors to Geosource Inc., Houston, Tex.

Filed Oct. 27, 1978, Ser. No. 955,261
Int. Cl.³ G01V 1/28
U.S. Cl. 367—60 **24 Claims**



1. A multi-channeled digital seismic field stacking system for processing seismic signals to form a stack of summed together receiver array response to a preselected number of energy impulses applied to the ground at selected impact points, thereby to obtain a composite seismic response to a variable source array, said seismic system comprising:

(A) at least one amplifier, for amplifying said seismic signals from selected points on the ground to obtain a sampled analog output signal, each seismic channel of said multi-channeled system having a multi-plexer sample time interval;

(B) an analog-to-digital converter, for converting said smapled analog output signal to a digital sample;

(C) means for applying pre-selected weighting coefficients to said digital sample in real time to obtain weighted samples;

(D) a digital stacking unit, for summing said weighted samples with the summed-together weighted samples of the seismic signals from the preceding ones of the preselected number of impulses which have occurred for a stack, said summed-together weighted samples in each of said channels obtained from seismic signals measured at the same point on the ground; and

(E) a digital storage unit, for storing said stacked seismic signals as a record when a portion of said preselected number of impulses have occurred, said records representing composite seismic responses to variable source arrays, each source array varied in accordance with said preselected weighting coefficients.

4,276,621
OBJECT CONFIRMING APPARATUS

Hideo Hiruma, and Yukio Maruhashi, both of Hamamatsu, Japan, assignors to Koa Denshi Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 5, 1979, Ser. No. 9,495
Claims priority, application Japan, Dec. 22, 1978, 54-83
Int. Cl.³ G01S 15/02
U.S. Cl. 367—97 **5 Claims**

1. An object confirming apparatus comprising:

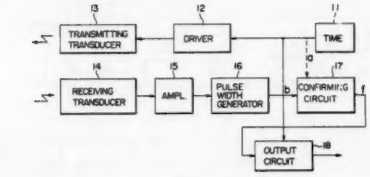
an ultrasonic wave transmitter for transmitting ultrasonic waves at a predetermined time interval;

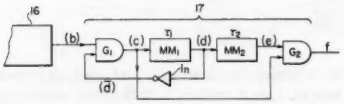
a receiver for receiving waves reflected by an object after the ultrasonic waves transmitted by said ultrasonic wave transmitter have impinged thereon;

a shaping circuit for shaping the output of the receiver into pulses of a predetermined width;

a first expected period setting circuit which receives an input from the shaping circuit and which sets an input expected period for a next pulse when it receives a first input pulse, and sets another expected period when it receives the next pulse within the input expected period or deems a further pulse as the first input pulse when it does not receive any input within the input expected period;

a first gate circuit whose signal input terminal is connected with the shaping circuit and whose gate control input terminal is connected with the output of the first expected period setting circuit;





a second expected period setting circuit which receives an output from the first gate circuit and which sets its input expected period when it receives its first input pulse and sets its next expected period when it receives its next input pulse within the input expected period of the second expected period setting circuit, or sets its next input pulse as the first input pulse thereof when it does not receive the next pulse within the input expected period;

a second gate circuit whose signal input terminal is connected with the shaping circuit and whose gate control input terminal is connected with the output of the second expected period setting circuit; and

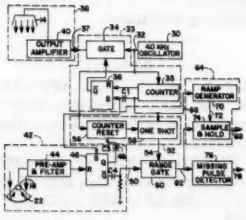
an output circuit which outputs an object confirming signal when more than one pulse is outputted from the second gate circuit.

4,276,622

ULTRASONIC DISTANCE MEASURING CIRCUIT

Ned E. Dammeyer, New Bremen, Ohio, assignor to Crown Controls Corporation, New Bremen, Ohio

Filed Jul. 16, 1979, Ser. No. 57,921
Int. Cl.³ G01S *11/00*
U.S. Cl. 367—118 **6 Claims**



1. Ultrasonic distance measuring apparatus for providing an output distance signal related to the distance between an ultrasonic transmitting transducer and an ultrasonic receiving transducer, comprising:

a reference oscillator means for providing a reference oscillator signal,

burst generator means, responsive to said reference oscillator means, for periodically generating ultrasonic burst signals,

an ultrasonic transmitting transducer means, responsive to said burst generator means, for providing an ultrasonic acoustic energy burst in response to each of said ultrasonic burst signals,

ultrasonic receiving transducer means for receiving said ultrasonic acoustic energy bursts and providing detection signals in response thereto,

range window means, responsive to said receiving transducer means and said oscillator means, for providing a range window signal at a time lagging each detection signal by a predetermined time period,

range gate means, responsive to said range window signal and to said detection signals, for providing output gate signals upon occurrence of said detection signal coincident with said range window signal, and

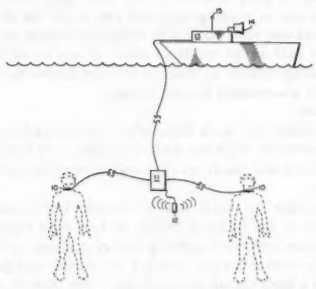
converter means, responsive to said ultrasonic burst signals and to said output gate signals, for providing an output distance signal related in potential to the distance between said transmitting and receiving transducer means.

4,276,623

UNDERWATER AUDIO INTERCOMMUNICATION SYSTEM

Frank R. Abbott, 3953 Wildwood, San Diego, Calif. 92107

Filed Oct. 17, 1979, Ser. No. 86,188
Int. Cl.³ H04B *11/00*
U.S. Cl. 367—132 **6 Claims**



1. A system for audio communication among divers and a surface support vessel comprising:

means carried by each diver for converting vocal signals into representative electrical signals;

means disposed remotely from the divers and coupled to receive the representative electrical signals for providing amplified signals;

means connected to the amplified signal providing means for projecting amplified vocal signals to impinge on the divers to asure their hearing the vocal signals;

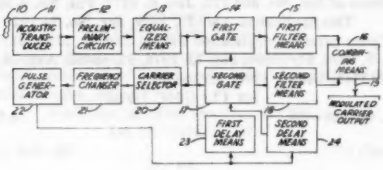
means interconnecting the amplified signal providing means and the surface support vessel for electrically linking therewith; and

means mounted on the surface support vessel and connected to the electrically linking means for enabling vocal transmissions.

4,276,624
ACOUSTIC TRANSMISSION SYSTEM

Charles B. Fisher, 2850 Hill Park Rd., Montreal, Quebec, Canada (H3H 1T1), and Sidney T. Fisher, 53 Morrison Ave., Town of Mt. Royal, Montreal, Quebec, Canada (H3R 1K3)

Filed Aug. 13, 1979, Ser. No. 66,182
Int. Cl.³ H04B 11/00
U.S. Cl. 367—134 6 Claims

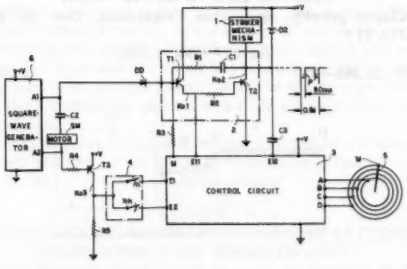


1. A system for the acoustic transmission of a signal over a gaseous or liquid transmission medium which comprises transmitting apparatus which emits a carrier of substantially constant frequency and amplitude, double-sideband amplitude modulated by said signal, as an acoustic wave over said transmission medium between said transmitting apparatus and receiving apparatus which receives said acoustic modulated carrier, with superimposed noise present in the transmission medium from other sources, and which rejects said superimposed noise by sampling, reconstruction and subtraction means, and derives said signal-modulated carrier substantially free from said superimposed noise.

4,276,625
BELL-STRIKING CLOCK

Rudolf Broghammer, Eschbronn-Mariazell, and Franz Käser, Schwarzwald, both of Fed. Rep. of Germany, assignors to Kundo - Kieninger + Obergfell, Schwarzwald, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 29,758, Apr. 12, 1979, abandoned. This application Mar. 10, 1980, Ser. No. 128,518
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1978, 2817762
Int. Cl.³ G04C 21/06
U.S. Cl. 368—75 10 Claims



1. An electronic clock emitting time signals corresponding to the strokes of ships' bells, comprising:

a clockwork including a generator of a square wave with two interleaved first and second half-cycles of different voltage levels;

normally blocked pulse-producing means with a recurrence period equal to less than a half-cycle but not less than a quarter-cycle of said square wave;

a striker mechanism connected to an output of said pulse-producing means for sounding a stroke in response to each pulse emitted thereby;

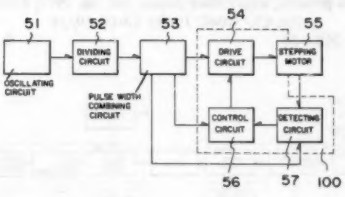
normally open switch means briefly closed by said clockwork every thirty minutes for activating a switching circuit into emission of an unblocking signal to said pulse-producing means, said generator having an enabling circuit connected to said pulse-producing means for making said unblocking signal effective only during said first half-cycles whereby not more than two consecutive pulses can be emitted to said striker mechanism during any cycle of said square wave; and

control means coupled with said clockwork and connected to said pulse-producing means for deactivating said switching circuit after the emission of a number of pulses rising from one through eight in successive half-hour intervals of a four-hour operating period.

4,276,626
ELECTRONIC WATCH

Katsuhiko Satoh; Kazuhiro Asano; Masaaki Mandai; Makoto Ueda; Akira Torisawa, and Masaharu Shida, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Apr. 20, 1978, Ser. No. 898,404
Claims priority, application Japan, Apr. 23, 1977, 52-47090
Int. Cl.³ G04B 19/04; G04C 3/00
U.S. Cl. 368—80 5 Claims

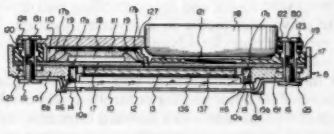


1. An electronic timepiece comprising: a stepping motor; an oscillating circuit for producing a time standard signal; a dividing circuit for frequency-dividing the time standard signal; a pulse combining circuit for combining the frequency-divided signals to produce normal drive pulses and correction drive pulses; a drive circuit for applying drive pulses to the stepping motor to effect driving of the stepping motor with the drive pulses; a detection circuit for detecting a rotation or non-rotation condition of the motor in response to the normal drive pulse after the application of the normal drive pulse; and means for controlling said drive circuit to apply a predetermined plurality of correction drive pulses to the motor instead of the normal drive pulses after the detection of a non-rotation condition.

4,276,627
MODULE STRUCTURE FOR ELECTRONIC DIGITAL TIMEPIECE

Katsuhiko Komiyama, Tokyo, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Feb. 15, 1979, Ser. No. 12,564
Claims priority, application Japan, Feb. 20, 1978, 53-18310; Feb. 20, 1978, 53-18312
Int. Cl.³ G04C 19/00; G04G 9/06
U.S. Cl. 368—84 15 Claims



1. An electronic watch module, comprising:

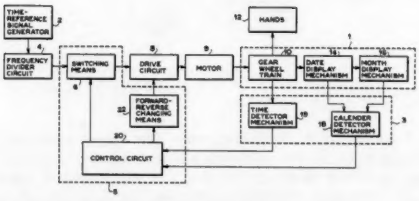
a housing made of electrically insulating material having one

side formed with a first recess and having another side formed with a second recess;
a circuit substrate, having first and second substrate sides, disposed in the second recess of said housing and having an integrated circuit chip mounted on said first substrate side;
a protector frame disposed in the second recess of said housing and having a first side attached to said first substrate side and a second side formed with an aperture, said protector frame having a recess;
a battery cell accommodated in the aperture of said protector frame;
a quartz crystal vibrator disposed in the recess of said protector frame and mounted on said circuit substrate at the same side as said integrated circuit chip and said battery cell; and
a liquid crystal display cell disposed in the first recess of said housing and facing to the second substrate side in close proximity thereto.

4,276,628
ELECTRONIC TIMEPIECE

Yasushi Nomura, Tokorozawa, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Jul. 25, 1978, Ser. No. 927,774
Claims priority, application Japan, Jul. 26, 1977, 52-89669
Int. Cl.³ G04C *19/00*; G04B *19/24*
U.S. Cl. 368—85 **9 Claims**

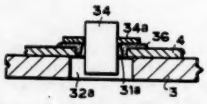


1. An electronic timepiece comprising:
(a) a time reference source generating a time reference signal;
(b) a frequency divider synthesizing a timing signal and a fast feed signal in accordance with said time reference signal;
(c) a driving circuit synthesizing a driving signal in response to said timing signal;
(d) a reversible motor driven by said driving signal;
(e) a mechanical time keeping mechanism for keeping time in response to forward drive of said reversible motor;
(f) time display means comprising hands for displaying in analog mode the time kept by said mechanical time keeping mechanism;
(g) date display means driven by reverse drive of said reversible motor;
(h) a time detection mechanism detecting a specified time of day in the time kept by said mechanical time keeping mechanism to generate a detection signal;
(i) control means receiving said detection signal, comprising:
(1) means for transmitting said timing signal to said reversible motor for driving said mechanical time keeping mechanism to keep time;
(2) means for transmitting said fast feed signal to said reversible motor and for controlling said driving circuit to drive said motor in a reverse direction, for a first period of time, for advancing said date display means in response to said detection signal; and
(3) means for transmitting said fast feed signal to said reversible motor and for controlling said driving circuit to drive said motor in a forward direction, for a second period of time, subsequent to advancing of said date display means;
(j) said reversible motor rotating said hands in a clockwise direction during forward drive thereof, and in a counterclockwise direction during reverse drive thereof.

4,276,629
SOLAR BATTERY TIMEPIECE

Osamu Matsumura, Choufu; Yutaka Kato, Kodaira; Tsunetoshi Sekiguchi, Sayama, and Ryo Namiki, Itabashi, all of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Division of Ser. No. 803,775, Jun. 6, 1977, Pat. No. 4,165,604.
This application Apr. 27, 1979, Ser. No. 34,192
Claims priority, application Japan, Jun. 8, 1976, 51/74938; Jun. 9, 1976, 51/73694; Jul. 23, 1976, 51/98458; Aug. 26, 1976, 51/113446; Dec. 6, 1976, 51/163327
Int. Cl.³ G04C *19/00*
U.S. Cl. 368—86 **4 Claims**

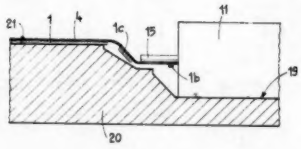


1. A circuit apparatus for use in an electronic or solar timepiece comprising:
(a) a base metal plate having an aperture (**32*a*, 32*b***) therein;
(b) an insulated flexible sheet (**4**) secured to and overlying said base metal plate, and having conductive patterns thereon and an aperture (**31*a*, 31*b***) therein;
(c) said aperture in said insulated flexible sheet having a size less than that of said aperture in said base metal plate; and formed so that said apertures are in overlapping registry when viewed from above;
(d) an electric circuit element (**34, 35**) having a terminal (**34*a*, 35*a***), and secured at the periphery of said aperture in said insulated flexible sheet by a means for securing; and
(e) said terminal having a size greater than that of said aperture in said insulated flexible sheet.

4,276,630
ELECTRONIC WATCH MOVEMENT

Daniel Paratte, Neuchatel, Switzerland, assignor to Fabrique d'Horlogerie de Fontainemelon S.A., Neuchatel, Switzerland

Filed Dec. 13, 1978, Ser. No. 969,187
Claims priority, application Switzerland, Dec. 14, 1977, 15379/77
Int. Cl.³ G04C *23/02*
U.S. Cl. 368—88 **2 Claims**



1. An electronic watch movement for a watch having a base which is rigid and which is shaped to receive a plurality of components, the movement comprising:
a film which is electrically insulating and flexible and which is provided with a plurality of both component openings and bending openings therethrough;
a foil affixed on the film and presenting a pattern of connection leads, there being sections of said leads extending above and across said bending openings, said film including portions which are separated from the remainder of the film and which are affixed to the lead sections so that the lead sections bend at predetermined locations; and

the plurality of components being located in said component openings and interconnected with said leads;

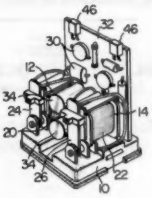
so that said film with said components interconnected thereto may be mounted on said base with said components being received by said relief and said lead sections extending above and across said bending openings being bent so that the film may bend to conform to the relief of the base.

4,276,631

ELECTRONIC TIMER

Teizo Fujita, Ibaraki; Toshiro Ohashi, Ikeda, and Kouji Takimoto, Kobe, all of Japan, assignors to Izumi Denki Corporation, Osaka, Japan

Filed Apr. 3, 1978, Ser. No. 892,709
Int. Cl.³ G04F *3/00*
U.S. Cl. 368—89 **7 Claims**



1. An electronic timer apparatus, comprising:

an electrically insulating base having upper and lower surfaces;

first and second electromagnetic relays secured on said upper surface of said base, each relay comprising an exciting coil and contact means at one of the opposite ends of said exciting coil, said relays being spaced from each other and in the same orientation on said upper surface;

a delay circuit comprising a plurality of electrical parts, at least one of which electrical parts is comparatively large;

means extending from said first surface for supporting said delay circuit adjacent to the other of said opposite ends of said exciting coils with said at least one comparatively large electrical part extending into the space defined between said first and second electromagnetic relays;

first and second output terminal means connected to the respective contact means of said first and second relays and extended from said lower surface of said base;

external power supply connection terminal means also extended from said lower surface and adapted to be connected to an external power supply for energizing a timer circuit comprising said exciting coils and said delay circuit; and

a casing disposed in engaged relation with said base to cover said first and second relays and said delay circuit.

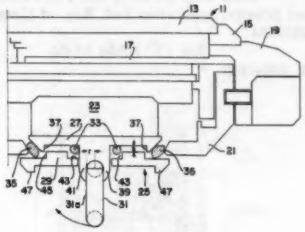
4,276,632

HATCH LOCKING MECHANISM FOR THE BATTERY COMPARTMENT OF A WRISTWATCH

Mamoru Hiraishi, Hino, Japan, assignor to Heiwado Boeki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1979, Ser. No. 77,186
Claims priority, application Japan, Sep. 22, 1978, 53-130635[U]; Mar. 23, 1979, 54-36986[U]
Int. Cl.³ G04C *10/00*; G04B *37/00*
U.S. Cl. 368—203 **17 Claims**

1. A hatch locking mechanism for a battery compartment formed at the rear side of a wristwatch, characterized in that the hatch comprises an inner cover having a tapered outer periphery portion and a central support shaft, an outer cover slidably mounted around said support shaft and having grooves for receiving respective seals, an operating lever pivotally supported by said support shaft and having a planar surface extending along a linear portion thereof, and seals received by said grooves respectively; in that a mouth of the battery compartment peripherally has a tapered portion in opposition to said tapered outer periphery portion of the inner cover, with a taper angle slightly different from that of the



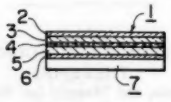
latter so as to define a gap therebetween which is gradually reduced inwardly; and in that as said lever is brought down, the outer cover is so urged by a distance corresponding to a radius r of said lever in the axial section thereof that the seal is urged wedgewise into the gap defined between the tapered portions.

4,276,633

SELF-LUMINESCENT LIGHT SOURCE FOR LIQUID CRYSTAL DISPLAY WATCH

Katsumi Takami, Tokyo, and Takashi Matsuzawa, Musashino, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 11, 1979, Ser. No. 29,012
Claims priority, application Japan, Apr. 12, 1978, 53/42100
Int. Cl.³ G04G *9/12*; G04B *19/30*; G04C *17/00*; G02F *1/13*
U.S. Cl. 368—227 **9 Claims**



1. A self-luminescent light source for a liquid crystal display watch comprising a fluorescent substance layer which has a light reflectivity and which contains a radioactive substance in at least a part thereof, a reflective layer comprising barium sulfate which is disposed on one surface of said fluorescent substance layer and which serves to reflect and scatter fluorescence from said fluorescent substance layer, a case which is disposed on the side of said reflective layer remote from said fluorescent substance layer and which serves to perform shielding from radiation given out from said radioactive substance, and a cover which is disposed on the side of said fluorescent substance layer remote from said reflective layer and which serves to absorb the radiation given out from said radioactive substance and to transmit the light from said fluorescent substance layer.

4,276,634
BATTERY OPERATED CLOCK

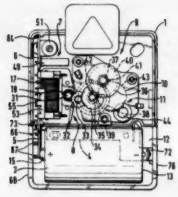
Friedrich Assmus; Hans Flaig, both of Schramberg; Robert Wolber, and Roland Maurer, both of Lauterbach, all of Fed. Rep. of Germany, assignors to Gebruder Junghans GmbH, Schramberg, Fed. Rep. of Germany

Filed Aug. 22, 1979, Ser. No. 68,595

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1978, 2839554

Int. Cl.³ G04B *37/00*

U.S. Cl. 368—300 **9 Claims**



1. An electrically operated movement in a clock, said movement comprising:

a multi-section housing including first and second relatively separable housing sections;

said first housing section carrying a plurality of bearing elements, positioning pins, guides, and support posts;

a dividing plate disposed between the housing sections and mounted on said support posts;

a plurality of hand-driving gears are disposed between said dividing plate and said first housing section and have shafts mounted in said bearing elements and in said dividing plate;

a circuit board mounted in said guides and being insertable in a direction parallel to said gear shafts and parallel to a direction of insertion of said dividing plate;

a stepping motor mounted to said circuit board, said motor comprising a coil, a stator, and a rotor,

said stator including holes receiving said positioning pins;

said rotor mounted on a shaft which is positioned in one of said bearing elements,

said coil being electrically connected to electric circuitry on said circuit board to be energized thereby;

intermediate gear means disposed between said dividing plate and said second housing section and operatively connecting said rotor with said hand-driving gears;

said dividing plate and hand-driving gears being completely offset relative to said circuit board, coil and stator in a direction perpendicular to said gear shafts.

4,276,635
PICKUP CARTRIDGE AND MOUNTING DEVICE THEREFOR

Shuichi Obata, Kyoto, and Masashi Ito, Settsu, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 21, 1980, Ser. No. 123,494

Claims priority, application Japan, Aug. 23, 1979, 54-35298[U]; Feb. 1, 1980, 55-12398[U]

Int. Cl.³ H04R *23/02*; G11B *3/02*

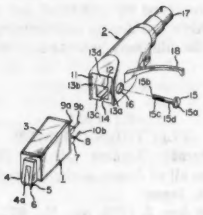
U.S. Cl. 369—256 **8 Claims**

1. A pickup cartridge mounting device comprising:

a pickup cartridge having at its rear end a plug protrusion having a trapezoidal cross-sectional area, and having a recess through it in a direction perpendicular to the axial direction of the cartridge,

a pickup cartridge mounting member having a recess with a matching trapezoidal cross-sectional area for receiving said plug protrusion, formed at the front end of said pickup cartridge mounting member, said recess having at least three walls,

a mounting screw extending through two of said walls and through said recess in said pickup cartridge plug protrusion for clamping said plug protrusion between said two



walls by drawing said two walls toward each other, said two walls being elastically deformable.

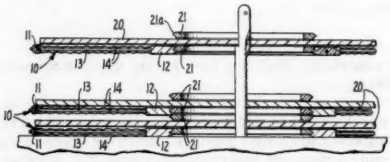
4,276,636
CUSHION DISC FOR PHONOGRAPH RECORDS

Stanley A. Morgan, and Edgar A. Dixon, both of 104 Montford Ave., Mill Valley, Calif. 94941

Filed Sep. 16, 1977, Ser. No. 833,888

Int. Cl.³ G11B *3/00*

U.S. Cl. 369—291 **2 Claims**



1. A protective disc for phonograph records and attachment means for disconnectably attaching said protective disc to phonograph records having approximately the same size and shape as the phonograph record with which it is to be used; said protective disc comprising:

a circular hoop, an inner circular ring, a plurality of spoke-like attachments supporting said inner circular ring from and within said hoop;

said attachment means comprising a second circular ring having a pressure sensitive adhesive applied to one side for affixation to the center ungrooved portion of a phonograph record, a groove formed on the peripheral edge of one of said rings and a snap engageable lip formed on the peripheral edge of the outer ring, said inner circular ring being formed with a pivoted lever having an edge portion engageable with the second circular ring, pivotal actuation of said lever causing a disengagement of said rings.

4,276,637
TIME-DIVISION SWITCHING NETWORK AND MEANS OF MITIGATING THE EFFECT OF FAULT CONDITIONS

Bernard Le Dieu, Perros-Guirec, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Jun. 6, 1979, Ser. No. 45,886

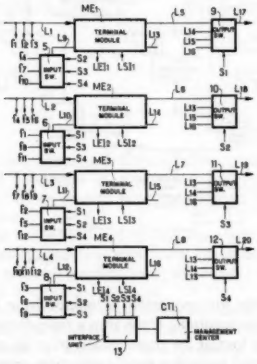
Claims priority, application France, Jun. 19, 1978, 78 18221

Int. Cl.³ H04J *3/14*

U.S. Cl. 370—16 **5 Claims**

1. Multistage time-division switching network and means for mitigating fault conditions therein, comprising a time-division or space-division signal line incoming stage and outgoing stage, the incoming stage being linked to main incoming lines and the outgoing stage being linked to main outgoing lines, said main incoming lines and main outgoing lines each comprising

the same number of signal lines, the incoming stage and outgoing stage each comprising the same number of switching units, a switching unit of the incoming stage and a switching unit of the outgoing stage forming a terminal module linked to a main incoming line and a main outgoing line, each terminal module being capable of handling a number n of signal lines at least equal to that in a main incoming line, characterised in that: (i) the main incoming and main outgoing lines each comprise a number m of signal lines less than the number n of signal lines which a terminal module can handle, (ii) in that the terminal modules are formed into groups, each group comprising a number of terminal modules equal to the ratio of the number n of signal lines which a terminal module can handle and the difference n−m between the number of signal lines which a terminal module can handle and the number of signal lines in a main incoming line if this ratio is an integer, and equal to the next higher integer if this ratio is not itself an integer, (iii) in that each main incoming line is divided into as many groups of signal lines as there are terminal modules minus one, (iv) in that the groups of signal lines of a main incoming line of a terminal



module are distributed amongst all the other terminal modules of the group, each group of signal lines containing a number of signal lines at most equal to the difference between the number of signal lines which a module can handle and the number of signal lines of a main incoming line, (v) in that each terminal module is associated with an input switch to which it is linked via an auxiliary incoming line and also with an output switch to which it is linked via a main outgoing line, in that each input switch is linked to one group of signal lines of each of the main incoming lines of the group except the main incoming line of the terminal module with which it is associated, (vi) in that each terminal module is linked via an auxiliary outgoing line to all the output switches of the group, except that with which it is associated, (vii) in that each output switch is linked to an outgoing line containing the same number of signal lines as a main incoming line, and (viii) in that said auxiliary incoming lines and auxiliary outgoing lines consist of the same number of signal lines which is at most equal to the difference between the number n of signal lines which a terminal module can handle and the number m of signal lines of a main incoming line.

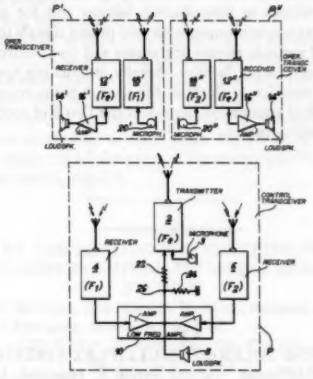
4,276,638

FREQUENCY MULTIPLEXED RADIO LINK APPARATUS

Pierre Andreucci, and Jacques Moron, both of Massy, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 15, 1979, Ser. No. 49,484
Claims priority, application France, Jun. 27, 1978, 78 19109
Int. Cl.³ H04L *5/14*; H04B *1/50*
U.S. Cl. 370—30 **4 Claims**

1. An apparatus for frequency multiplexed radio links between a control transceiver and at least two operator transceivers, said apparatus being of the type in which the control transceiver comprises a transmitter receiving a low frequency signal from a microphone and transmitting a high frequency wave Fe and receivers equal in number to the operator transceivers, each receiver being adjusted to a particular high frequency Fi which differs from Fe, each receiver supplying a low frequency signal which is directed to a loudspeaker and in



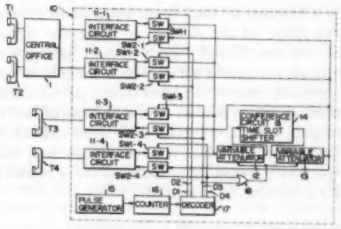
which each operator transceiver comprises a receiver adjusted to said frequency Fe and supplying a loudspeaker and a transmitter connected to a microphone and operating on one of the said frequencies Fi, and means located in the control transceiver for reinjecting part of the low frequency signals supplied by each of the receivers of the control transceiver into the transmitter of said transceiver.

4,276,639

TELEPHONE EXCHANGE WITH TIME SHARED SPEECH PATHS AND SELECTIVELY ATTENUATED SPEECH SIGNALS

Takeo Fukuda, Yokohama; Tadashi Murayama, Kawasaki, and Kiyoshi Urui, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 30, 1979, Ser. No. 25,585
Claims priority, application Japan, Apr. 14, 1978, 53/43999
Int. Cl.³ H04M *3/56*
U.S. Cl. 370—62 **5 Claims**



1. A telephone exchange comprising a plurality of interface circuits each having a transmission path and a reception path; first switching means with one end coupled to the transmission paths of the interface circuits; second switching means coupled to the reception paths of the interface circuits; first and second

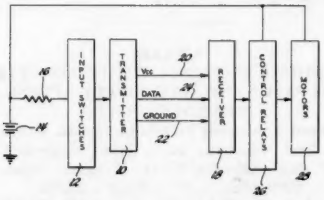
variable attenuating means coupled at one end to the first and second switching means, respectively; a conference circuit coupled between the other ends of the first and second variable attenuating means; and control means coupled to the first and second switching means and to the first and second variable attenuating means for supplying timing signals to the first and second switching means and thus controlling the same in time-sharing fashion, thereby establishing speech paths among the interface circuits in time-sharing fashion and for supplying control signals synchronous with said timing signals to the first and second variable attenuating means and thus controlling the same in time-sharing fashion, thereby attenuating speech signals being transferred through the speech paths according to the controlled attenuation factors of the first and second variable attenuating means.

4,276,640

NOISE TOLERANT MULTIPLEX SYSTEM

James W. McNamee, Warren; Gerald E. Homstad, Cortland; Alfonso Vazquez-Cuervo, Warren, all of Ohio, and Kenneth J. Henry, Southfield, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 2, 1979, Ser. No. 54,021
Int. Cl.³ H04J 3/00
U.S. Cl. 370—77 **6 Claims**



1. A noise tolerant time division multiplex system for operation in the presence of noise having a maximum frequency FN and maximum pulse width TN, said system including a source of direct current potential for energizing said system, a plurality of input switches, a plurality of output devices, the cumulative effect of the presence of a turn-on signal at an output device as a function of time being equal and opposite to the cumulative effect of the absence of a turn-on signal at the output device, one of said output devices having a response time TO to an energizing signal which is equal to or greater than the response time of the other output devices, transmitter means responsive to actuation of one or more of said switches for developing a multi-bit serial data word indicative of the status of said input switches, receiver means, said transmitter means repetitively transmitting said data word to said receiver means at a minimum word rate of

$$\frac{4\,TR\,FN}{TR(1-2\,FNTN)-TO}$$

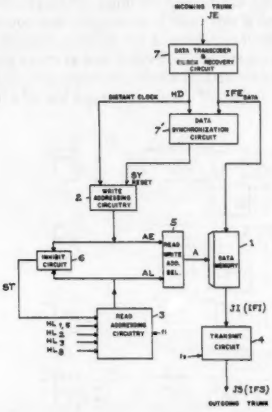
where TR is the desired maximum time interval between actuation of an input switch and operation of an output device, said receiver means responsive to receipt of a data word for producing output signals indicative of the status of said input switches, means responsive to the outputs of said receiver means for selectively energizing said output devices.

4,276,641

METHOD AND APPARATUS FOR CONVERTING TIME-DIVISION DATA SIGNALS RECEIVED ON AN INCOMING TRUNK TO TIME-DIVISION DATA SIGNALS OF DIFFERENT FORMAT FOR TRANSMISSION OVER AN OUTGOING TRUNK

Hieu K. Nguyen, Paris; Marc P. G. Dieudonne, Igny, and Jean-Paul Lager, Bougival, all of France, assignors to Le Material Telephonique, Boulogne-Billancourt, France

Filed May 25, 1979, Ser. No. 42,410
Claims priority, application France, May 31, 1978, 78 16211
Int. Cl.³ H04J 3/00
U.S. Cl. 370—99 **10 Claims**



3. Apparatus for converting a time-division data signal received over an incoming trunk into a time-division data signal of a different format for transmission over an outgoing trunk, each data signal including synchronization, speech and signalling information, the incoming data signal being divided into frames received at a frequency F, each frame containing v_e incoming channels assigned to speech, (i.e. n_e incoming bits received at a frequency f_e) said outgoing data signal being divided into frames transmitted at the same frequency F, each frame containing v_s outgoing channels, of which V_s channels are assigned to speech, (i.e. n_s outgoing bits transmitted at a frequency f_s) where $n_s > n_e$, $f_s > f_e$ and f_s is not a multiple of f_e characterized by: means for storing the data bits contained in each incoming frame; means for reading, at an intermediate frequency f_i and during read-enable periods, the stored data bits corresponding to v_e busy outgoing channels and for evenly distributing $v_s - v_e$ free outgoing channels amongst the v_e busy outgoing channels during read inhibit periods; and, means for transmitting, at a frequency f_s, the data read-out at the intermediate frequency f_i.

4,276,642

PROCESS FOR THE FRAME SYNCHRONIZATION OF A TIME DIVISION MULTIPLEX SYSTEM

Joachim Siglow, Wolfratshausen, Fed. Rep. of Germany; Sigmar Grützmann, Zug, Switzerland, and Erwin Schenk, Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

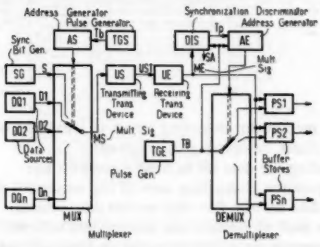
Filed Mar. 6, 1979, Ser. No. 17,921
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1978, 2811851
Int. Cl.³ H04J 3/06
U.S. Cl. 370—100 **2 Claims**

1. A method for the frame synchronization of a time division multiplex system with a multiplexer, which per time division multiplex frame has m time slots and which releases a time division multiplex signal which for each time division multi-

plex frame has m−1 data bits and one synchronizing bit, at least p≧6 synchronizing bits which directly follow one another from corresponding consecutive time frames to form a synchronizing word, wherein for attainment of a synchronous state a synchronization alarm signal is released, and wherein a synchronizing signal is provided for said frame synchronization, comprising the steps of:

(a) when in a non-synchronous state, and as so indicated by the synchronization alarm signal, beginning a test period after two consecutive synchronizing words are recognized and when the synchronizing signal is in phase with the two synchronizing words;

(b) ending the test period and having the alarm signal indicate and synchronous state if the synchronizing signal is in phase with a number of subsequent groups of P time division multiplex frames synchronizing words continuously received;



(c) ending the test period and having the alarm signal indicate the non-synchronous state if the synchronizing signal is in phase with the synchronizing words but a synchronizing word is not recognized; and

(d) ending the test period and having the alarm signal indicate the non-synchronous state if the synchronizing signal is not phased in with the synchronizing words even though two synchronizing words are recognized but whose respective synchronizing bits lie in different time slots of the respective time division multiplex frames.

4,276,643

METHOD OF AND MEANS FOR ROUTING BINARY MESSAGES THROUGH A MULTINODE DATA-TRANSMISSION SYSTEM

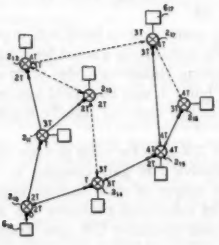
Jean-Claude Laprie; David R. Powell, both of Ramonville Saint Agne; Gerard Alcouffe, Valence, and Paul Romand, Bourg de Peage, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine and Societe Crouzet, Paris, both of, France

Filed Mar. 14, 1979, Ser. No. 20,475

Claims priority, application France, Mar. 17, 1978, 78 07906

Int. Cl.³ G06F *11/00*

U.S. Cl. 371—8 **15 Claims**



1. A method of routing binary messages through a digital-data-transmission system including a network formed from a multiplicity of nodes each having at least three input/output ports respectively linked by one two-way connection to an associated subscriber station and by a plurality of other two-way connections to as many other nodes of said network, said nodes forming a plurality of different pathways between any two subscriber stations for allowing a message originating at any one of said subscriber stations to reach all other of said subscriber stations,

comprising the steps of:

(a) detecting at each node the arrival, at the several ports thereof, of an incoming message traveling over different pathways from an originating subscriber station;

(b) selecting, at each node, one of the ports thereof for exclusive reception of said incoming message; and

(c) retransmitting at each node the received incoming message via all the ports of the node including the port selected in step (b).

4,276,644

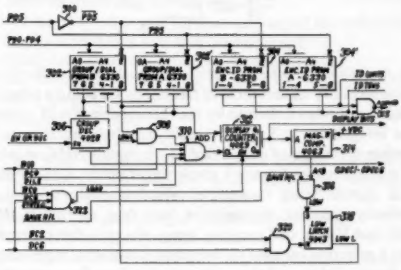
TESTER AND METHOD FOR CHECKING METER ENCODERS IN AUTOMATIC METER READING SYSTEMS

Gordon J. DeWitte, Los Alamos, N. Mex., assignor to General Electric Company, Somersworth, N.H.

Filed Mar. 28, 1978, Ser. No. 890,924

Int. Cl.³ G06F *11/00*

U.S. Cl. 371—25 **10 Claims**



1. In an automatic meter reading system of the type having a meter including gear train driven dials and including a readable encoder, for generating a serialized message consisting of dial readings, driven by said gear train whereby each gear in the gear train has a definite mechanical relationship to the other gears in the train, a method of determining the meter dial readings and checking for encoder generated errors by inter-dial checking the mechanical angular position between the respective dial drive gears of the gear train comprising the steps of:

(a) storing in a first addressable memory information representative of encoder dial readings;

(b) storing in a second memory information representative of ranges of angular positions of gears driving said dials;

(c) reading said encoder message;

(d) utilizing, as an address for said first and second memories, a first dial reading in said message to effect the retrieval from said first and second memories, respectively, a numerical value proportional to said first dial reading and information representative of the angular position of the gear driving said first dial;

(e) storing the angular position information retrieved from said second memory;

(f) utilizing, as an address for said first and second memories, a second dial reading in said message to effect the retrieval from said first and second memories respectively of a second numerical value proportional to said second dial reading and information representative of the angular position of the gear driving said second dial;

(g) storing the last angular position information retrieved from said memory;

(h) comparing the angular position information first retrieved from said second memory with the second numerical value retrieved from said first memory; and

(i) deriving an indication of an encoder interdial check failure when there is a non comparison.

4,276,645

RECEIVER FOR SIMULTANEOUSLY TRANSMITTED CLOCK AND AUXILIARY SIGNALS

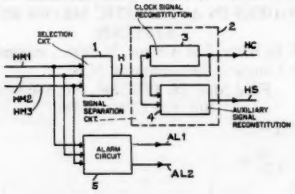
Jean-Paul Lager, Bougival, and Daniel A. Vautherin, Paris, both of France, assignors to Le Material Telephonique, Boulogne-Billancourt, France

Filed May 25, 1979, Ser. No. 42,565

Claims priority, application France, May 31, 1978, 78 16210

Int. Cl.³ G06F *11/18*

U.S. Cl. 371—36 **5 Claims**



1. An improved receiver for clock signals (HC) of frequency F, and auxiliary signals (HS) of frequency f, f being a submultiple of F and related thereto by the relationship F=kf, where k is an integer, k=2, 3, 4, . . . , said signals being transmitted together by means of a modified clock signals (HM) in which one pulse is omitted every k clock signal pulses, said modified clock signals being transmitted simultaneously over three, nominally identical, transmission lines (e.g. as signals HM1, HM2, and HM3), said receiver being of a type that comprises:

(a) a selection circuit (1), including a majority logic circuit, connected to said three transmission lines for generating a normal, modified clock signal (H) even if one of the received, modified clock signals (HM1, HM2, or HM3) is abnormal; and

(b) a signal separation circuit (2), connected to the output of said selection circuit, for reconstituting said clock signals (HC) and said auxiliary signals (HS),

(c) an alarm circuit having three inputs, each connected to a corresponding one of said three transmission lines, at the input to said selection circuit, for generating an encoded digital alarm signal upon failure of any one of said three transmission lines, said alarm circuit including means for detecting signal non-conformities which comprises:

(1) three detector circuits (14,15,16), each connected to a corresponding one of said three transmission lines, for detecting the absence of incoming signal pulses;

(2) first (18) and second (19) comparison circuits, respectively connected to the first (HM1) and second (HM2) ones of said three transmission lines, for comparing the signals transmitted over said first and second transmission lines with the signal transmitted over said third transmission line (HM3), delayed by a quarter period in a delay line (17), said delayed signal acting as a reference signal for each of the two other transmitted signals; and

(3) a logic circuit (20,21) having inputs connected to the outputs of said first and second comparison circuits (18,19) to the output of the detector circuit (16) associated with said delay circuit (17), for generating said encoded alarm signals.

4,276,646

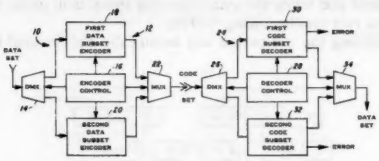
METHOD AND APPARATUS FOR DETECTING ERRORS IN A DATA SET

Roger L. Haggard, Garland; Jerold A. Seitchik, and T. R. N. Rao, both of Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 5, 1979, Ser. No. 91,681

Int. Cl.³ G06F *11/12*

U.S. Cl. 371—37 **12 Claims**



1. A method for detecting errors in a data set of sequential binary digits, comprising the steps of:

encoding the data set to form a code set by:

separating alternating ones of the sequential digits of the data set into first and second data subsets;

for each of the first and second data subsets:

generating a binary cyclic redundancy code of a selected form for the digits of said data subset; and

appending the digits of the data subset cyclic redundancy code to the end of said data subset to form a corresponding code subset;

merging the first and second code subsets to form the code set, with each of the sequential digits of the first code subset being sequentially interposed between sequential digits of the second code subset;

operating upon the code set in a manner having a significant probability of altering at least one of the digits of the code set;

decoding the code set to detect errors therein by:

separating alternating ones of the sequential digits of the code set into the first and second code subsets; and

for each of the first and second code subsets:

generating a binary cyclic redundancy code of said selected form for the digits of said code subset;

providing an error signal in response to said code subset cyclic redundancy code having a value indicative of a error in said code subset.

4,276,647

HIGH SPEED HAMMING CODE CIRCUIT AND METHOD FOR THE CORRECTION OF ERROR BURSTS

Charles P. Thacker, Palo Alto; Fielding M. Norman, Torrance, and Ronald E. Rider, Palos Verdes Estates, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 2, 1979, Ser. No. 63,022

Int. Cl.³ G06F *11/10*

U.S. Cl. 371—40 **10 Claims**

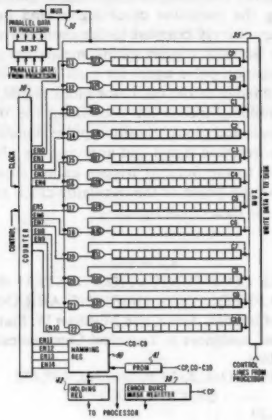
1. A circuit, comprising an input and an output, for transmitting a data field comprising a serial bit stream and for simultaneously generating Hamming codes to be used for correcting an n bit error burst in said data field comprising:

m storage means, each for serially storing n bits of binary data,

an exclusive OR gate for each storage means, the output of each exclusive OR gate coupled to the storage means input, the output of each storage means coupled to one input of its associated exclusive OR gate, and the other input of said exclusive OR gate coupled to said circuit input,

an m bit counter for enabling said exclusive OR gates in binary count order, said counter incrementing every n^{th} data bit time, to generate and store in said storage means

n Hamming codes, each m bits long, during the data field transmission time, and



a multiplexer for coupling said data field from said circuit input to said circuit output, and thereafter, for coupling said Hamming codes from said storage means output to said circuit output.

4,276,648

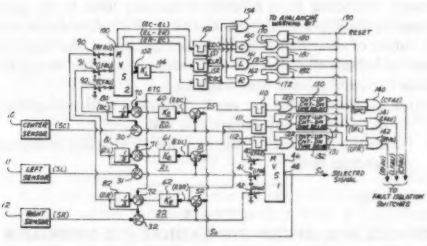
MIDVALUE SIGNAL SELECTION AND FAULT DETECTION APPARATUS AND METHOD

Lloyd R. Tomlinson, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 4, 1979, Ser. No. 71,902

Int. Cl.³ G06F *11/18*; G06B *9/03*

U.S. Cl. 371—68 **10 Claims**



1. Signal selector apparatus for selecting one of several input information signals comprising:

midvalue selector means, having a plurality of inputs and an output, for passing that input signal having a value between the other input signals to its output; and

equalizer means including means for predeterminedly processing each information input signal and eliminating null offsets contained therein, said equalizer means further comprising means for intercoupling said midvalue selector means and said equalizer means such that the signal produced at said midvalue selector output is the midvalue one of the equalizer means processed information input signals bounded by those equalizer means processed information input signals having values above and below said midvalue.

4,276,649

RECEIVER FOR DIGITAL SIGNALS IN LINE CODE

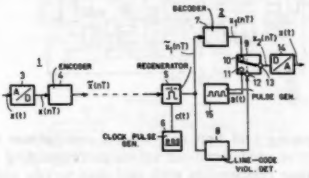
Gradus C. Groenendaal, and Einar A. Aagaard, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 21, 1979, Ser. No. 50,712

Claims priority, application Netherlands, Jun. 30, 1978, 7807171

Int. Cl.³ G06F *11/00*

U.S. Cl. 371—55 **2 Claims**



1. A receiver for receiving a line signal constituted by a first digital signal, said first digital signal being encoded in a line code and representing a digital version of an analog information signal, the receiver comprising:

an input for receiving the line signal;

a decoder coupled to said input and arranged for converting the line signal into said first digital signal;

a digital-to-analog converter comprising an input;

means for coupling the input of the digital-to-analog converter to said decoder;

characterized in that:

the receiver further comprises:

the line-code violation detector also coupled to the input of the receiver and arranged to detect whether the line signal deviates from the line code; and

a generator for generating a second digital signal;

wherein said coupling means comprises

a first input coupled to said decoder, a second input coupled to said generator, an output coupled to said digital-to-analog converter, and a control input coupled to said line-code violation detector for selectively coupling said first or second input to said output, whereby when said line-code violation detector indicates a deviation from said line-code, said generator is then coupled to the input of said digital-to-analog converter.

4,276,650

METHOD OF SYNCHRONIZING A QUADPHASE RECEIVER AND CLOCK SYNCHRONIZATION DEVICE FOR CARRYING OUT THE METHOD

Frank de Jager; Rudolf A. van Doorn; Johannes V. Verboom, and Marino G. Carasso, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 11, 1979, Ser. No. 56,482

Claims priority, application Netherlands, Mar. 26, 1979, 7902340

Int. Cl.³ H04L *7/02, 25/48*

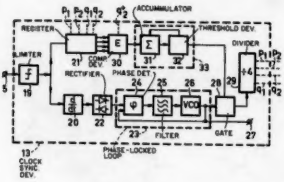
U.S. Cl. 375—110 **5 Claims**

1. A method for the clock synchronization of a receiver for demodulating a quadphase coded data signal, said data signal comprising data words consisting of first, second, third and fourth equally long, consecutive half-bit intervals, characterized in that the steps of said method comprise:

(a) determining the frequency of the half-bit intervals of said data words;

(b) sampling the data words at the frequency determined in step (a);

(c) storing the sampling values for at least four half-bit intervals;
(d) determining a first comparison value from the difference between the sampling values of the third and first, respectively, of said four half-bit intervals;
(e) determining a second comparison value from the difference between the sampling values of the fourth and second, respectively, of said four half-bit intervals;

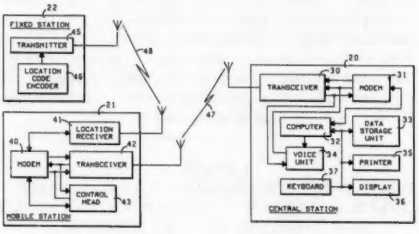


(f) comparing said first and second comparison values to respective predetermined values corresponding to a correct phase relationship with said data words; and
(g) forming a correction signal to adjust the phase of said frequency with respect to the data words when either of said first or second comparison values differ from the respective predetermined values.

4,276,651
CLOCK CIRCUITRY FOR A DATA COMMUNICATION SYSTEM

Stephen M. Bench, Lake Zurich; William R. Dirkes, Mundelein; Manohar A. Juglekar, Elk Grove; James C. Secora, Hoffman Estates, and Michael A. Stephen, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 830,531, Sep. 6, 1977, Pat. No. 4,156,867. This application Jan. 29, 1979, Ser. No. 7,087
Int. Cl.³ H03L *7/06*
U.S. Cl. 375—120 **3 Claims**

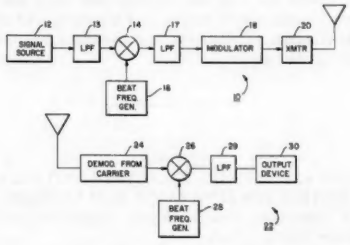


1. A clock circuitry continuously synchronizable to a digital data signal serially transmitted by a data clock signal having a predetermined frequency, comprising:
delay means coupled to the digital data signal for providing a delayed digital data signal delayed with respect to the digital data signal by a predetermined time interval;
first combining means for combining the digital data signal and the delayed digital data signal to provide a bit-transition pulse signal for each bit transition of the digital data signal;
oscillator means for providing an oscillator clock signal having a free-running frequency substantially the same as the frequency of the data clock signal, said oscillator means further including Schmitt trigger gating means for providing the oscillator clock signal and buffer gating means capacitively coupled to the oscillator clock signal from the Schmitt trigger gating means for providing a clock-transition pulse signal for each predetermined logical state change of the oscillator clock signal; and
second combining means for combining the bit-transition pulse signals and clock-transition pulse signals to provide a phase correction signal and applying the phase correction signal to the Schmitt trigger gating means for synchronizing the phase of the oscillator clock signal to the phase of the data clock signal.

4,276,652
SECURE COMMUNICATION SYSTEM WITH IMPROVED FREQUENCY-HOPPING ARRANGEMENT

Arnold M. McCalmont, Acton, and Matthew W. Slate, Sudbury, both of Mass., assignors to Technical Communications Corp., Concord, Mass.

Filed Oct. 2, 1978, Ser. No. 947,475
Int. Cl.³ H04K *1/04*
U.S. Cl. 455—29 **13 Claims**



1. In a secure communications system of the type in which information bearing signals are scrambled by repeatedly shifting their frequency spectrum in excursions up or down within a range extending from a lower frequency limit to an upper frequency limit in a predetermined manner in accordance with the output of a variable beat frequency generator, the improvement in which the variable frequency generator comprises means for varying said beat frequency
(a) in increments that are small compared with substantially all of the frequency excursions, and
(b) with the durations of the increments varying on a pseudo-random basis.

4,276,653
DEVICE FOR RECEIVING RADIO CALL MESSAGES

Jan A. Aarsen, Gouda, and Herman da Silva, Voorburg, both of Netherlands, assignors to Staat der Nederlanden (Staatsbedrijf der Posterijen, Telegrafie en Telefonie), The Hague, Netherlands

Filed Apr. 12, 1979, Ser. No. 29,492
Claims priority, application Netherlands, Apr. 14, 1978, 7804012
Int. Cl.³ H04B *1/06, 7/04*
U.S. Cl. 455—56 **8 Claims**

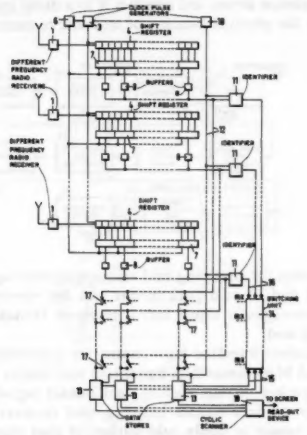
1. Device for receiving radio call messages on a ship from different transmitters at different stations, which device comprises a number of receivers (1) for different frequencies from said different transmitters and means for storing and processing the messages received, said device comprising:
(A) a shift register means (4) connected to the output of each receiver,
(B) an identifier (11) means connected to the output signal,

having the value 1 or 0, from said shift register to provide an output control signal with respect to the pertinence of the messages to said ship,

(C) a plurality of storing means (13),

(D) a switching unit (14) connected to the outputs of said identifier means,

(E) said switching unit (14) in response to said output control signal connects the appropriate shift register means to an available storing means (13),



(F) a commonly controlled clock generator means for controlling said shift register means, said identifier means, and said storing means, which said clock generator means integrates asynchronously received signals into synchronous signals, and

(G) a cyclic scanner (18) for reading out said storing means to one or more terminal stations for further storing and processing the pertinent stored message.

4,276,654

SCAN-LOCK CONTROL OF SOLID STATE DIGITALLY SYNTHESIZED RECEIVERS

William N. Nations, Alameda, Calif., and Kenneth H. Kerwin, II, Londonderry, N.H., assignors to Pacific Marine Electronics, Inc., Oakland, Calif.

Continuation-in-part of Ser. No. 741,294, Nov. 12, 1976, abandoned. This application Apr. 16, 1979, Ser. No. 30,568

Int. Cl.³ H04B *1/16;* H03J *7/18*

U.S. Cl. 455—160 **17 Claims**

1. A scan-lock control device for use with a high frequency receiver, which receiver is provided with a local/remote switch and a specially designed interface so that the receiver functions normally in its local mode and is controlled in its remote mode to add frequency scanning and lockup functions without affecting any of the receiver's other locally controlled funtions, wherein said scan-lock control device comprises:

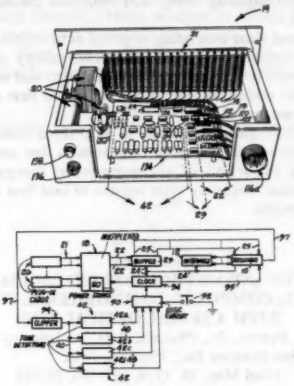
(a) multiplexer means for sequentially selecting frequency data, said multiplexer having a power source and output bus lines operatively connected thereto,

(b) a plurality of frequency-determining, plug-in card means operatively connected to the multiplexer means for supplying predetermined frequency data embodied in each card to the multiplexer when any one of said cards is activated by the multiplexer,

(c) multiplexer clock means operatively connected to both the receiver and the multiplexer and activated any time the receiver is switched to its remote mode, said multiplexer clock thereby providing a driving means for said multiplexer,

(d) a plurality of tone detectors means operatively connected to both the receiver and the multiplexer clock, said tone detector means having means connected therewith to determine when receiver audio output signals are adequate for tone reception, and

(e) gating logic means operatively connected to both the



tone detectors and the multiplexer clock for either enabling the multiplexer to step the multiplexer to the next frequency if there is no output from any tone detector, or to lock the multiplexer in its present frequency when output signals from the receiver remain adequate.

4,276,655

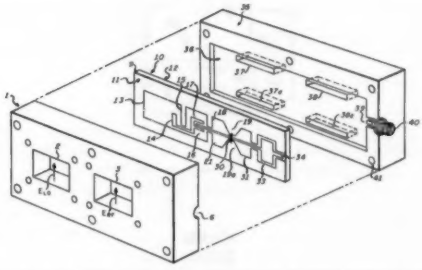
INTEGRATED CIRCUIT PLANAR HIGH FREQUENCY MIXER

Erich H. Kraemer, Clearwater, and John C. Rolfs, Palm Harbor, both of Fla., assignors to Sperry Corporation, New York, N.Y.

Filed Oct. 29, 1979, Ser. No. 89,069

Int. Cl.³ H04B *1/26;* H03C *1/58*

U.S. Cl. 455—327 **10 Claims**



1. High frequency signal mixer means including:

substrate means,

conductive layer means disposed on said substrate means and having a substantially closed pattern of at least first, second, and third clear areas,

said first clear area having probe means for coupling electromagnetic energy of a first frequency propagating perpendicular to said first clear area for propagation, in turn, along balanced transmission line means into said second clear area,

said second clear area being divided symmetrically by said balanced transmission line means, and

said second clear area further including opposed conductive truncated taper means disposed symmetrically about said balanced transmission line means,

first and second diode means respectively coupled from the

apex of one of said opposed conductive truncated taper means to said balanced transmission line means and from the latter to the apex of a second of said opposed conductive truncated taper means for interaction with said energy propagating along said balanced transmission line means,

said second clear area being disposed as to enable said diodes to be immersed in electromagnetic energy of a second frequency propagating perpendicular to said second clear area for additional interaction with said first and second diode means, and

planar filter means disposed in said third clear area and coupled to said balanced transmission line means for allowing extraction of electromagnetic energy having a difference frequency with respect to said first and second frequencies.

4,276,656

APPARATUS AND METHOD FOR REPLACEMENT OF A PARALLEL, COMPUTER-TO-PERIPHERAL WIRE LINK WITH A SERIAL OPTICAL LINK

Edward M. Petryk, Jr., Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Mar. 19, 1979, Ser. No. 21,743

Int. Cl.[3] H04B 9/00

U.S. Cl. 455—608 **11 Claims**

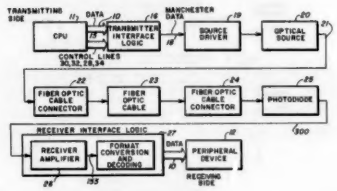
1. An optical link apparatus for transmitting data between units of a system, said system including a transmitting means for supplying data on a data line to be transmitted over an optical link, said system further including receiving means for receiving data from said optical link apparatus for performing some function therewith, said optical link apparatus comprising:

(a) a control line for causing the transfer of said data upon a change in a control signal on said control line;

(b) a transmitter interface logic means for receiving said data on said data line and responsive to said control signal for converting said data into a packet of data signals preceded by a header signal for transmission over said optical link;

(c) a source means for converting said header and data packet signals into an electromagnetic signal;

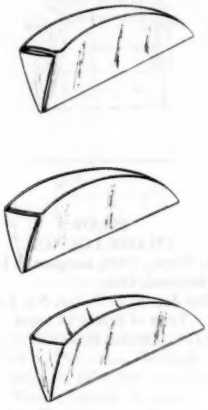
(d) a path means to receive said electromagnetic signal from said source means and conduct it to a distal end removed from the physical location of said source means;



(e) a means for receiving said electromagnetic signal at the distal end of said path means and for converting said electromagnetic signal into a received Manchester data signal; and

(f) a receiver interface logic means for converting said received Manchester data signal into said header signal and said packet of data signals, said header signal and said packet of data signals enabling said receiver interface logic means to apply said packet of data signals to an output interface line.

259,670
TACO SHELL
Bernice L. de Leon, 1543 S. Saltair, West Los Angeles, Calif. 90025
Filed Nov. 1, 1978, Ser. No. 956,482
Term of patent 14 years
Int. Cl. D01—*01*
U.S. Cl. D1—2

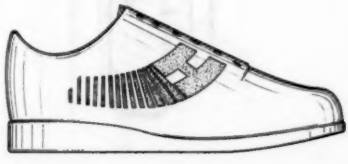


259,671
BATHING SUIT
Michel Joseph, Saverne, France, assignor to Adidas Fabrique de Chaussures de Sport, Landersheim, France
Filed Aug. 1, 1979, Ser. No. 62,885
Claims priority, application France, Feb. 6, 1979, 353
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—40

259,672
BATHING SUIT
Michel Joseph, Saverne, France, assignor to Adidas Fabrique de Chaussures de Sport, Landersheim, France
Filed Aug. 1, 1979, Ser. No. 62,886
Claims priority, application France, Feb. 6, 1979, 353
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—40

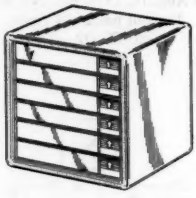
259,673
WALLPAPERING APRON
Sue M. Ruszczynski, 27193 Wyatt, Trenton, Mich. 48183
Filed Aug. 16, 1979, Ser. No. 67,096
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—229

259,674
SHOE
Monte Levin, New York, N.Y., assignor to Manow International Corp., New York, N.Y.
Filed Mar. 5, 1979, Ser. No. 17,472
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309



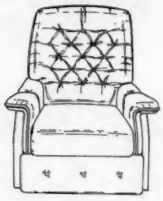
259,675
FOOT STABILIZER INNERSOLE
Andrew W. Gordon, Swampscott, and Carlman Fisher, Marblehead, both of Mass., assignors to Northern Shoe Bindings Co., Inc., Beverly, Mass.
Filed Jun. 25, 1979, Ser. No. 51,953
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—318

259,676
CONTAINER FOR TAPE CASSETTES
Peter Ackeret, Küsnacht, Switzerland, assignor to IDN Inventions and Development of Novelties AG, Chur, Switzerland
Filed Apr. 26, 1979, Ser. No. 33,675
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1978, 1156
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—35

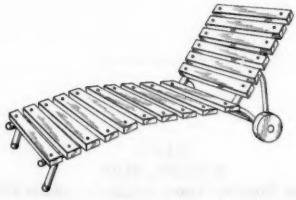


259,677
CARRYING BAG FOR GOLF SHOES
Monroe H. Rosenow, 14265 Hyland Dr., Brookfield, Wis. 53005
Filed Apr. 11, 1979, Ser. No. 29,549
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—37

259,678
SEAT
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Nov. 28, 1977, Ser. No. 855,263
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—37

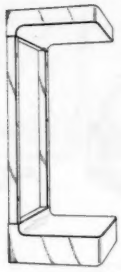


259,679
CHAISE LOUNGE
Joseph W. Sroub, Parma, Ohio, assignor to Cardinal American Corporation, Cleveland, Ohio
Filed Jan. 5, 1979, Ser. No. 1,375
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—38



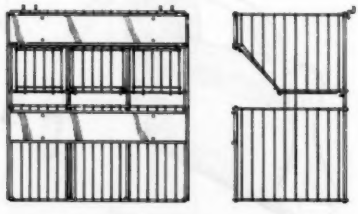
259,680
SIDE CUSHION CHAIR
Jobie G. Redmond, High Point, N.C., assignor to Jack Daniel Distillery, Lem Motlow, Prop., Inc., Lynchburg, Tenn.
Filed Nov. 8, 1978, Ser. No. 959,047
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—70

259,681
DISPLAY RACK
Cornelis G. Bouwman, Rucphen, Netherlands, assignor to Benjamin Products B.V., Etten-Leur, Netherlands
Filed Nov. 7, 1978, Ser. No. 958,432
Claims priority, application Fed. Rep. of Germany, May 13, 1978, MR 14081
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—85



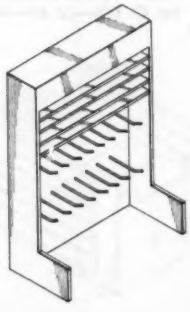
259,682
CONTAINER FOR SPARE TOILET TISSUE ROLL
Guy L. Standing, 519 N. Maryland, Glendale, Calif. 91206
Filed May 29, 1979, Ser. No. 42,936
Term of patent 14 years
Int. Cl. D23—*02*; D6—*04*
U.S. Cl. D6—97

259,683
PAINT ROLLER DISPLAY RACK
Garry Furst, West Newton, Mass., assignor to American Brush Company, Inc., Brockton, Mass.
Filed Dec. 22, 1978, Ser. No. 972,379
Term of patent 14 years
Int. Cl. D20—*02*; D6—*04*
U.S. Cl. D6—130



259,684
DISPLAY RACK
Charles L. Davis, Atlanta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.
Filed Jun. 25, 1979, Ser. No. 51,392
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—148

259,685
DISPLAY UNIT
John J. Scalice, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Dec. 11, 1978, Ser. No. 968,000
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—157



259,686

DRESSER OR THE LIKE

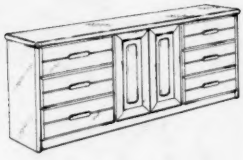
Haywood L. West, High Point, N.C., assignor to Burlington Furniture Div. of Burlington Industries, Inc., Greensboro, N.C.

Filed Feb. 21, 1979, Ser. No. 13,015

Term of patent 14 years

Int. Cl. D06—*04*

U.S. Cl. D6—164



259,687

COMBINED COSMETIC DISPLAY AND STORAGE UNIT

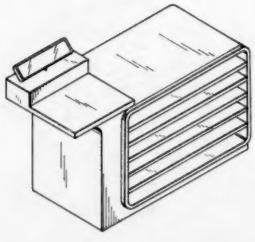
John J. Scalice, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.

Filed Dec. 11, 1978, Ser. No. 968,002

Term of patent 14 years

Int. Cl. D20—*02*; D6—*04*

U.S. Cl. D6—186



259,688

CHAIR SHELL

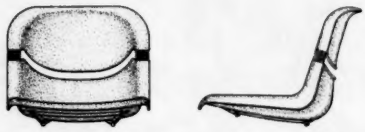
Emilio Ambasz, New York, N.Y., assignor to Center for Design Research and Development N.V., Netherlands Antilles

Filed Dec. 4, 1978, Ser. No. 966,466

Term of patent 14 years

Int. Cl. D6—*06*

U.S. Cl. D6—197



259,689

COUNTERBALANCED UPHOLSTERED HEADREST

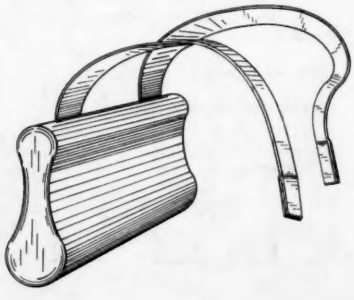
David M. Handel, South Orange, N.J., assignor to The Bennington Company, Union, N.J.

Filed Oct. 31, 1978, Ser. No. 956,153

Term of patent 14 years

Int. Cl. D6—*06*

U.S. Cl. D6—200



259,690

DISH WITH HINGED COVER

Renate Buchsteiner nee Fetzer, Gingen, Fed. Rep. of Germany, assignor to Johannes Buchsteiner GmbH & Co. KG, Gingen, Fed. Rep. of Germany

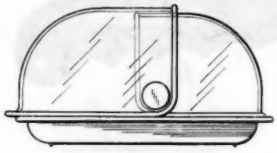
Filed Jun. 19, 1978, Ser. No. 917,022

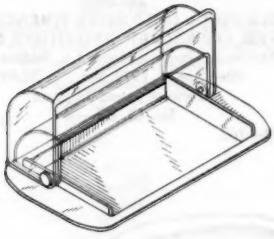
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1977, 1605

Term of patent 14 years

Int. Cl. D07—*01*

U.S. Cl. D7—16





259,691

DECAL FOR CULINARY WARE OR THE LIKE

Richard Hora, Congers, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jul. 16, 1979, Ser. No. 58,122

Term of patent 14 years

Int. Cl. D7—*01;* D19—*08*

U.S. Cl. D7—39

259,692

KETTLE

Leonard L. Quinn, Barrie, Canada, assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Aug. 30, 1979, Ser. No. 70,769

Term of patent 14 years

Int. Cl. D07—*02*

U.S. Cl. D7—65

259,693

POLE CHARCOAL GRILL

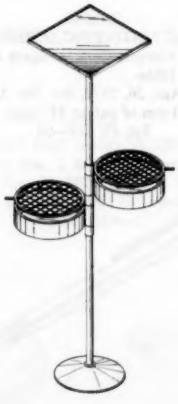
Albert D. Ottmar, Beresford, S. Dak. 57004

Filed Apr. 9, 1979, Ser. No. 28,161

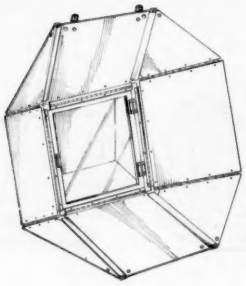
Term of patent 14 years

Int. Cl. D7—*02*

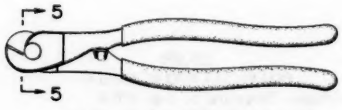
U.S. Cl. D7—109



259,694
SOLAR OVEN
Daniel S. Halacy, Jr., 5804 W. Vista Ave., Glendale, Ariz. 85301
Filed Feb. 12, 1979, Ser. No. 11,137
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—110



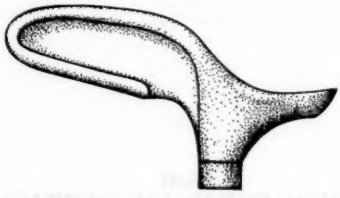
259,695
CABLE CUTTER
Bjarne I. Byberg, Walnut Creek, and Robert B. Kientz, Orinda, both of Calif., assignors to Benner-Nawman, Inc., Pleasant Hill, Calif.
Filed Sep. 11, 1978, Ser. No. 929,259
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—58



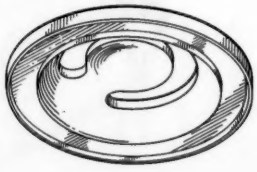
259,696
TELESCOPIC MAGNETIC SCREW STARTER
Janet D. Shea, Fort Morgan, Colo., assignor to Parker-Hannifin Corp., Cleveland, Ohio
Filed Apr. 26, 1979, Ser. No. 33,543
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—86

259,697
UTILITY KNIFE HANDLE
Louis E. Brizzolara, Jr., Norwalk, Conn., assignor to CBS Inc., New York, N.Y.
Filed Mar. 6, 1979, Ser. No. 18,081
Term of patent 14 years
Int. Cl. D08—*03*
U.S. Cl. D8—107

259,698
HANDLE FOR A GOLF SPIKE WRENCH, SCREW DRIVER, CORKSCREW AND OTHER DEVICES
Arden B. MacNeill, Garrison House La., Sudbury, Mass. 01776
Filed Apr. 2, 1979, Ser. No. 26,033
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—107



259,699
TIE-DOWN DEVICE
John D. Hughes, 55 Half Moon Rd., Novato, Calif. 94947
Filed Aug. 18, 1978, Ser. No. 926,011
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367



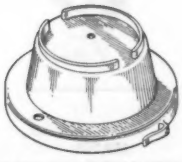
259,700
HOOK
Lee R. Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., Stamford, Conn.
Filed Oct. 18, 1978, Ser. No. 952,584
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367

259,701
BOTTLE
Luis Sztuden, 5556 Bloch St., San Diego, Calif. 92122
Division of Ser. No. 899,838, Apr. 25, 1978. This application Jul. 17, 1980, Ser. No. 169,883
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—310

259,702
BOTTLE OR SIMILAR ARTICLE
Edwin Richmond, P.O. Box 2656, San Rafael, Calif. 94901
Filed Nov. 13, 1978, Ser. No. 959,656
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—314

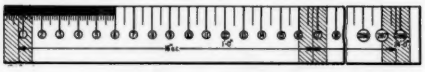
259,703
BOTTLE
Jacques Llorente, 112, Avenue du General de Gaulle, La Garenne Colombes, France
Filed Apr. 3, 1979, Ser. No. 26,578
Claims priority, application France, Oct. 6, 1978, 78 41797
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—384

259,704
CAP FOR A DISINFECTANT DISPENSER
Robert Castronovo, Belmont, Calif., assignor to Trident Products, Inc., San Francisco, Calif.
Filed Nov. 2, 1977, Ser. No. 848,017
Term of patent 14 years
Int. Cl. D09—*07*
U.S. Cl. D9—447

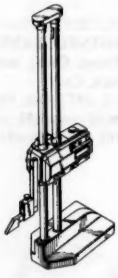


259,705
TOP FOR A DRINK CUP
Connice W. Bagwell, Rte. 2, Box 346, Somerville, Ala. 35670
Filed Sep. 28, 1979, Ser. No. 79,720
Term of patent 14 years
Int. Cl. D09—*07*
U.S. Cl. D9—454

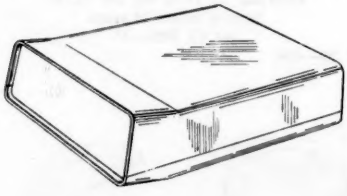
259,706
CARPENTERS' LAY-OFF TAPE
Floyd A. Smith, P.O. Box 192, Clayton, Ind. 46118
Filed Jul. 26, 1977, Ser. No. 819,206
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—71



259,707
HEIGHT GAUGE
Shingo Nishina, Kanagawa, Japan, assignor to Mitutoyo Manufacturing Company, Ltd., Tokyo, Japan
Filed Aug. 10, 1979, Ser. No. 65,601
Claims priority, application Japan, Feb. 13, 1979, 54-4675
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—73



259,708
ELECTRONIC INSTRUMENT HOUSING OR SIMILAR ARTICLE
Nicholas D. Swinstead, Church Crookham, England, assignor to Solartron Electronic Group Limited, Farnborough, England
Filed Jun. 1, 1978, Ser. No. 913,261
Claims priority, application United Kingdom, Dec. 13, 1977, 982602/77
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—80

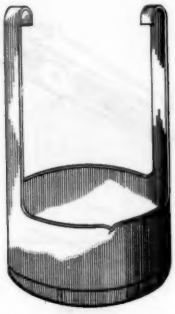


259,709
GOLFER'S PIN
Jennifer A. Brown, Taunton, Mass., assignor to Claudette A. LaBonte, Swansea, Mass.
Filed Jan. 15, 1979, Ser. No. 3,215
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—61

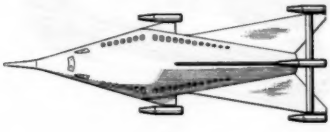
259,710
COMBINED FLOWER POT AND SAUCER
Ben Stein, Montreal, Canada, assignor to Benst Holdings Ltd., Montreal, Canada
Filed Oct. 15, 1979, Ser. No. 85,009
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—152

259,711
HORSEMAN FIGURE
Charles A. MacLean, 23073 Beech, Dearborn, Mich. 48124
Filed Apr. 25, 1979, Ser. No. 33,128
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—159

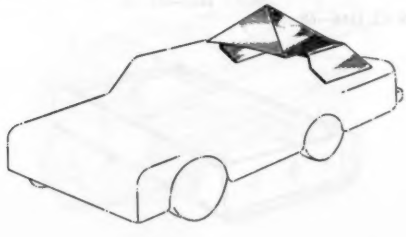
259,712
DRIP RECEPTACLE FOR A HANGING PLANT CONTAINER
William T. Heydenreich, 906 Florida, Huntington Beach, Calif. 92646
Filed Mar. 19, 1979, Ser. No. 21,459
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—164



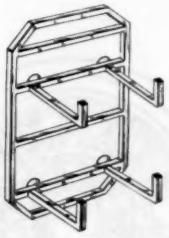
259,713
AIRPLANE
Perry B. Johnson, 169 N. Main St., Paterson, N.J. 07522
Filed Jul. 31, 1978, Ser. No. 929,854
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—326



259,714
VEHICLE AUXILIARY COMPARTMENT
Frederick P. Feeley, 3709 Cypress St., Las Vegas, Nev. 89030
Filed Jun. 12, 1978, Ser. No. 914,375
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156

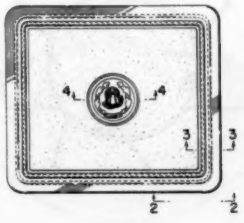


259,715
VAN DOOR LUGGAGE RACK
Dennis A. Melilli, 68-408 Indigo, Cathedral City, Calif. 92234
Filed Oct. 10, 1978, Ser. No. 949,441
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157

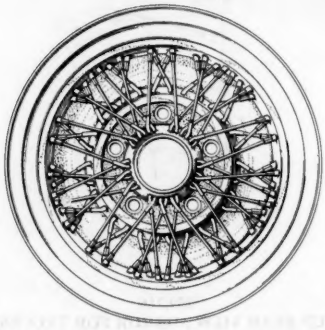


259,716
BACK-UP REAR VIEW MIRROR FOR TRUCKS AND LIKE VEHICLES
Toshio Watanabe, 24007 South Broad St., Carson, Calif. 90745
Filed Jun. 7, 1979, Ser. No. 46,303
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—187

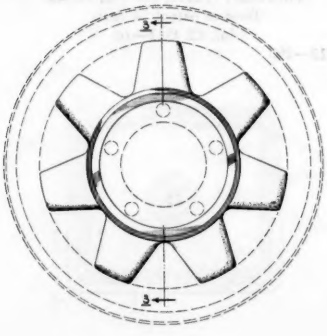
259,717
REAR AUTO MAT
Dwight N. Wooters, La Grange, Ga., assignor to Rubbermaid Specialty Products Inc., LaGrange, Ga.
Filed Mar. 7, 1979, Ser. No. 18,348
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—203



259,718
WHEEL
Curtis Norris, 502 W. Aurora St., Santa Ana, Calif. 92707
Filed Aug. 28, 1978, Ser. No. 937,256
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205

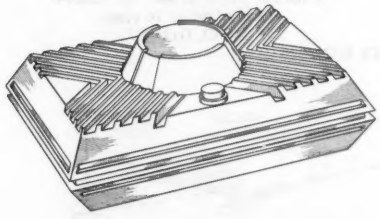


259,719
WHEEL CENTER
Merlyn R. Reppert, 28045 Palos Verdes Dr. East, Rancho Palos Verdes, Calif. 90274
Filed Oct. 16, 1979, Ser. No. 85,401
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209

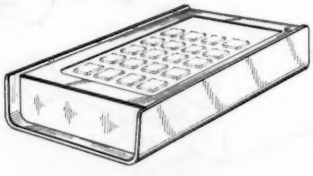


259,720
CLIPLEAD ELECTRODE FOR USE IN ATTACHING ELECTRONIC APPARATUS TO AN ANIMAL'S SKIN
Gregory H. Piesinger, 6702 E. Cactus Rd., Scottsdale, Ariz. 85254
Filed Jun. 4, 1979, Ser. No. 44,960
Term of patent 14 years
Int. Cl. D13—*03;* D24—*99*
U.S. Cl. D13—24

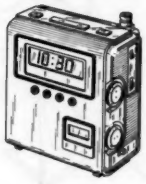
259,721
CONTROL MODULE
Kenneth Pusl, Valencia, Calif., assignor to Electrofilm, Inc., North Hollywood, Calif.
Filed May 15, 1978, Ser. No. 905,804
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32



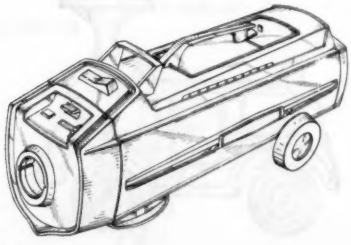
259,722
BROADCASTING SYSTEM PORTABLE RECEIVING TERMINAL HOUSING
Stanley E. Fuller, Toledo, and Erich F. Roeck, Perrysburg, both of Ohio, assignors to Digital Data, Inc., Toledo, Ohio
Filed May 15, 1978, Ser. No. 906,141
Term of patent 14 years
Int. Cl. D14—*03, 02*
U.S. Cl. D14—68



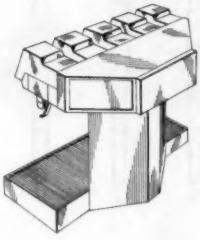
259,723
CLOCK RADIO RECEIVER
Peter H. J. van de Ven, Valkenswaard, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 30, 1979, Ser. No. 71,202
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—73

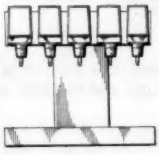


259,724
VACUUM CLEANER
John T. Ferraris, Stamford, Conn., assignor to Electrolux Corporation, Old Greenwich, Conn.
Filed Jan. 15, 1979, Ser. No. 4,139
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—55

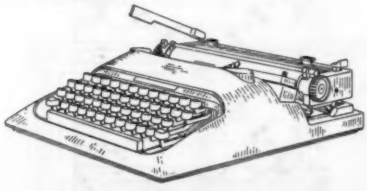


259,725
BEVERAGE DISPENSING TOWER
Henry Wasserstrom, Chicago, and Edward Klein, Wilmette, both of Ill., assignors to Alco Foodservice Equipment Company, Miami, Fla.
Filed Jul. 10, 1979, Ser. No. 56,457
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—115



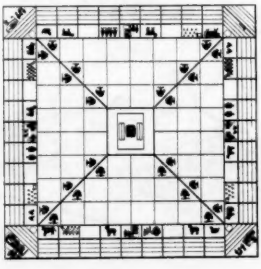


259,726
PORTABLE TYPEWRITING MACHINE
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Italy
Filed Aug. 16, 1979, Ser. No. 67,208
Claims priority, application Italy, Feb. 22, 1979, 52979/79[U]
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—1



259,727
WRITING INSTRUMENT
Clarence Zierhut, Richardson, Tex., assignor to The Gillette Company, Boston, Mass.
Filed Feb. 23, 1979, Ser. No. 14,623
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—51

259,728
GAME BOARD
Ibrahim D. Laws, c/o William Johnson, 32, Ormond Gate, London, SW3, England
Filed Jul. 21, 1978, Ser. No. 926,927
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—25



259,729
KINETIC SCULPTURE
Hidetoshi Matsui, 6-27-311, Imazunaka 3-chome, Tsurumi-ku, Osaka, Japan
Filed Oct. 24, 1979, Ser. No. 88,207
Claims priority, application Japan, Aug. 30, 1979, 54-36426
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D21—62

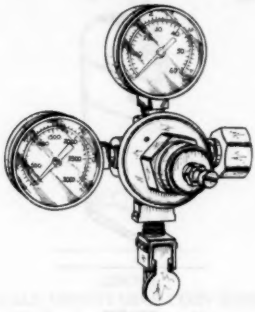
259,730
TOY BUS
Avi Arad, Westport, and Edward B. Bretschger, Cos Cob, both of Conn., assignors to Empire of Carolina, Inc., New York, N.Y.
Filed Feb. 9, 1979, Ser. No. 11,007
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—78

259,731
JIG SAW PUZZLE OR THE LIKE
John O. Van Koert, 190 E. 72nd St., New York, N.Y. 10021
Filed Sep. 23, 1977, Ser. No. 836,198
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—104

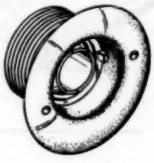
259,732
OFFSET HOSEL FOR A GOLF CLUB
Tony J. Vella, 3504 Wesleyan Ave., Rockford, Ill. 61108
Filed May 7, 1979, Ser. No. 36,746
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—221

259,733
HOSE NOZZLE
Craig R. Tisserat, Alta Loma; Enric C. Mendoza, Walnut, both of Calif.; Marnie C. Averitt, and Humbert Olivari, both of Houston, Tex., assignors to Rain Bird Sprinkler Consumer Mfg. Corp., Glendora, Calif.
Filed Mar. 25, 1980, Ser. No. 133,956
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18

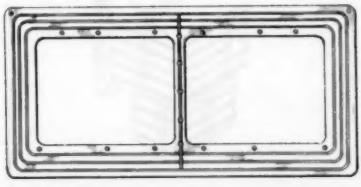
259,734
GAS PRESSURE REGULATOR
Vincent Cerrato, Pomona, N.Y., assignor to Vending Components, Inc., Hackensack, N.J.
Filed Dec. 22, 1977, Ser. No. 863,537
Term of patent 14 years
Int. Cl. D23—*01*; D10—*04*
U.S. Cl. D23—21



259,735
HYDRO-THERAPY FITTING DESIGN
Gerald W. Moreland, 11651 Pickett La., Garden Grove, Calif. 92640
Filed Nov. 5, 1979, Ser. No. 91,061
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—34

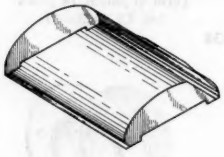


259,736
VENTILATOR SECTION
Elwin E. Peirce, 3890 Monroe Ave. Northeast, and Arthur L. Waltz, 4415 - 75th Ave. Southeast, both of Salem, Oreg. 97301
Filed Dec. 4, 1978, Ser. No. 966,149
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—163

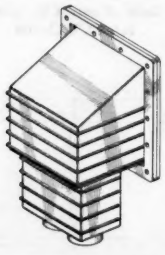


259,737
LOW FREQUENCY POWER SUPPLY FOR MEDICAL TREATMENT APPARATUS
Isao Kitai, and Tsutomu Yamasaki, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Aug. 3, 1978, Ser. No. 930,737
Claims priority, application Japan, Feb. 9, 1978, 53-4703
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—8

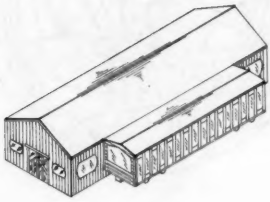
259,738
ULTRAVIOLET LAMP HOUSING
Armando Boschetti, Bryan, Ohio, assignor to Paul B. Elder Company, Bryan, Ohio
Filed Nov. 16, 1978, Ser. No. 961,215
Term of patent 14 years
Int. Cl. D24—*04;* D26—*05*
U.S. Cl. D24—68



259,739
POOL SKIMMER
Lawrence E. Johnson, Dana Point, Calif., assignor to South Pacific Industries, Santa Ana, Calif.
Filed Jun. 20, 1979, Ser. No. 50,449
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—2

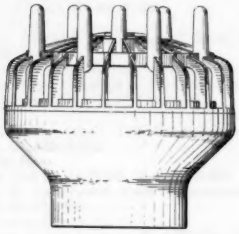


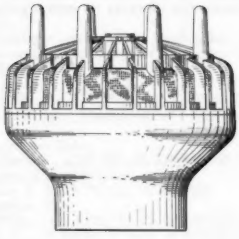
259,740
RAILROAD RESTAURANT
Gary M. Levin, 940 E. 19 St., Brooklyn, N.Y. 11230
Division of Ser. No. 928,387, Jul. 27, 1978. This application Apr. 30, 1980, Ser. No. 145,048
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—11



259,741
LIGHTER
Franz A. Stuetzer, Muehlheim, Fed. Rep. of Germany, assignor to Rowenta-Werke, GmbH, Offenbach, Fed. Rep. of Germany
Filed Nov. 3, 1977, Ser. No. 848,366
Claims priority, application Fed. Rep. of Germany, May 7, 1977, 510022
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36

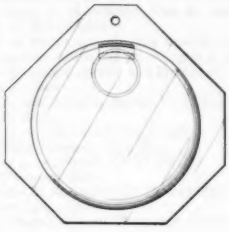
259,742
AIR DIFFUSER FOR A HAIR DRYER
Pasquale Iammatteo, Holmdel, N.J., assignor to Conair Corporation, Edison, N.J.
Filed Jun. 1, 1979, Ser. No. 44,452
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—18





259,743
RAZOR
Eleanor Hollinger, R.D. 2, Box 283, Camden, Del. 19934
Filed Jul. 2, 1979, Ser. No. 53,834
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—46

259,744
WALL MOUNTABLE COIN BANK
Tony Robert, 5701 Southwest Freeway, Houston, Tex. 77057
Filed Jan. 2, 1979, Ser. No. 284
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D99—35



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF JUNE, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.W. Faber-Castell: *See—*
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Aagaard, Einar A.: *See—*
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Aarsen, Jan A.; and da Silva, Herman, to Staat der Nederlanden (Staatsbedrijf der Posterijen, Telegrafie en Telefonie). Device for receiving radio call messages. 4,276,653, Cl. 455-56.000.

AB Kabi: *See—*
Claeson, Karl G.; Aurell, Leif E.; and Simonsson, Leif R., 4,276,375, Cl. 435-13.000.

AB Volvo Penta: *See—*
Soderbaum, Carl U., 4,275,991, Cl. 416-142.000.

Abbott, Frank R. Underwater audio intercommunication system. 4,276,623, Cl. 367-132.000.

Abbott Laboratories: *See—*
Becker, Frank C.; and Li, Jorge P., 4,276,090, Cl. 106-18.320.
Firca, Joseph R.; and Rudbach, Jon A., 4,276,050, Cl. 23-230.00B.
Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, 4,276,413, Cl. 536-17.00R.

Abbott, Richard V., III. Method and apparatus for insulating building blocks and the blocks produced thereby. 4,275,539, Cl. 52-309.110.

Abe, Fumiyuki; and Hayashi, Yoshimasa, to Nissan Motor Company, Limited. Cooling system for internal combustion engine. 4,275,688, Cl. 123-41.120.

Abercrombie, Bolling A., to McMurry-Hughes, Inc. Surface controlled liquid removal method and system for gas producing wells. 4,275,790, Cl. 166-314.000.

Abo, Tokushi: *See—*
Takagi, Takeshi; and Abo, Tokushi, 4,275,862, Cl. 248-205.00A.

Abramson, Harold B. Thermal-break window. 4,275,526, Cl. 49-501.000.

AccuRay Corporation: *See—*
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Actionair Equipment Limited: *See—*
Field, Sydney J., 4,275,762, Cl. 137-601.000.

Acurex Corporation: *See—*
Pfefferle, William C., 4,276,203, Cl. 252-462.000.

Adler, Franklin P.; and Starks, Marvin, to Richmond Tank Car Company. Railway hopper car roof support structure. 4,275,662, Cl. 105-377.000.

Adler, Stanford L., Sr.; Gordon, Abraham; and Ornstein, Leonard, to Technicon Instruments Corporation. Method for histology specimen labelling. 4,276,253, Cl. 264-247.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
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Pohler, Friedmar; Falk, Hans; Muller, Josef; Klein, Hans J.; and Hoffacker, Franz, 4,276,324, Cl. 427-10.000.
Wernicke, Ubbo; Matejec, Reinhart; and Moll, Franz, 4,276,372, Cl. 430-505.000.

Aggarwal, Sundar L.; Marker, Leon F.; Dudek, Thomas J.; and Herold, Robert J., to General Tire & Rubber Company, The. Apparatus for making cast annular laminates. 4,276,009, Cl. 425-130.000.

Aguinet, Gerard; Le Bras, Andre; Manoury, Jean; and Martin, Edouard, to Produits Chimiques Ugine Kuhlmann. Manufacture of concentrated nitric acid. 4,276,277, Cl. 423-393.000.

Ahuja, Arjan D.; and Brewer, James E., to Hughes Aircraft Company. Two terminal power control switch with triac current powered control means. 4,276,486, Cl. 307-252.00B.

Aicher, Helmut: *See—*
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Air Industrie: *See—*
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Akasaki, Katsuyuki: *See—*
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Akebono Brake Industry Co. Ltd.: *See—*
Miyake, Katsuya, 4,275,933, Cl. 303-106.000.

Akerkar, Anandrao S.; and Rutner, Herman, to Becton, Dickinson and Company. Radiolabeled derivatives of folic acid. 4,276,280, Cl. 424-1.000.

Akers, Roy, to Bell & Howell Company. Mail sorting machine. 4,275,875, Cl. 271-5.000.

Akzo N.V.: *See—*
Henne, Werner; and Dunweg, Gustav, 4,276,172, Cl. 210-490.000.
Spanjersberg, Albertus C.; Mink, Hans G.; and Barwegen, Johannes H. M., 4,275,834, Cl. 239-3.000.

Alb. Klein GmbH & Co. KG: *See—*
Bastgen, Wendel, 4,276,168, Cl. 210-396.000.

Alcouffe, Gerard: *See—*
Laprie, Jean-Claude; Powell, David R.; Alcouffe, Gerard; and Romand, Paul, 4,276,643, Cl. 371-8.000.

Aldridge, Frederick T., to United States of America, Energy. Chromatographic hydrogen isotope separation. 4,276,060, Cl. 55-67.000.

Alexander, Robert: *See—*
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Alf Hannaford & Co. Pty. Ltd.: *See—*
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Allied Chemical Corporation: *See—*
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Van Hook, James P.; Hildebrand, Clair E.; and Chan, Chong H., 4,276,276, Cl. 423-385.000.

Alter, Siegfried, to Metzenauer & Jung GmbH. Switch arrangement with switch contacts which can be changed as desired to normally open or normally closed operation. 4,276,458, Cl. 200-153.00J.

Aluotto, Patrick F.: *See—*
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Amazonen-Werke: *See—*
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American Air Filter Company, Inc.: *See—*
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American Can Company: *See—*
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American Coldset Corp.: *See—*
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AMF Incorporated: *See—*
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AMP Incorporated: *See—*
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Andersen, Harold W.; Andersen, Shirley R.; Zaner, Clifford; and Harrison, Charles H., to Anprosol Incorporated. Sterilization system. 4,276,263, Cl. 422-292.000.

Andersen, Jorgen; and Reimer-Nielsen, Ib. Method and an apparatus for transferring a reference liquid from an ampoule to an electrochemical measuring instrument. 4,275,774, Cl. 141-1.000.

Andersen, Lowell J., to International Co-op. Method of preparing hash brown potato product. 4,276,314, Cl. 426-272.000.

Andersen, Shirley R.: *See—*
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Anderson, Burton C.: *See—*
Clement, Robert A.; and Anderson, Burton C., 4,276,226, Cl. 260-410.500.

Anderson, Carl R.; Wellwood, James J.; and Happ, Lawrence R., to Shure Brothers, Inc. Stabilizing and static removing attachment for phonograph pickup cartridge. 4,275,888, Cl. 369-74.000.

Anderson, James H. Turbopump unit for deep wells and system. 4,276,002, Cl. 417-405.000.

Anderson, Richard J., to Zoecon Corporation. Cyano-3-phenoxybenzyl N-1-(1-naphthyl) ethylcarbamate. 4,276,230, Cl. 260-465.00D.

Anderson, Ronald A., to Lockformer Company, The. Ventilating system collar with lock means. 4,275,707, Cl. 126-318.000.

Anderson, Verner; Logan, David J.; and Wood, Kenneth O., to Gulf & Western Corporation. Apparatus for cutting cigar wrappers from natural tobacco leaves. 4,275,627, Cl. 83-152.000.

Anderstorps Werkstads Aktiebolag: *See*—
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Ando, Yoshinori; Inoue, Sakae; and Takahashi, Kiyotaka, to Ando, Yoshinori. Process for preparing ultrafine carbide powder. 4,276,275, Cl. 423-345.000.

Andoh, Masayasu: *See*—
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Andreoli, Angelo; Boano, Adolfo; and Vesco, Mario. Fluid suspension unit for motorcycles. 4,275,900, Cl. 280-710.000.

Andreucci, Pierre; and Moron, Jacques, to Commissariat a l'Energie Atomique. Frequency multiplexed radio link apparatus. 4,276,638, Cl. 370-30.000.

Andrews, Glenn C., to Pfizer Inc. 5-Keto-L-ascorbic acid-5,5-dimethyl ketal, derivatives thereof and its use as an antioxidant and intermediate. 4,276,219, Cl. 260-343.700.

Andrews, James R.; Balke, Rodney W.; and Berry, Victor L., to Textron, Inc. Mode controlled attachment of rotor mounted components. 4,275,992, Cl. 416-146.00R.

Annan, David E.: *See*—
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Anoshko, Vladimir A.; Godin, Eduard M.; Gavrilov, Anatoly N.; Zverkov, Garik E.; Matskevich, Vladimir I.; Chepurin, Valentin M.; Semenov, Valentin P.; Grachev, Vladimir V.; and Butylin, Mikhail Y. Apparatus for manufacture of corrugated pipes. 4,275,579, Cl. 72-59.000.

Anprosol Incorporated: *See*—
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Antonious, Anthony J. Adjustable and flexible closure assembly for monk style shoes. 4,275,513, Cl. 36-50.000.

Aoki, Katashi. Nozzle device for molding plastics. 4,276,014, Cl. 425-547.000.

Aoki, Shigeru, to Murata Manufacturing Co., Ltd. Thermal fuse. 4,276,532, Cl. 337-408.000.

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Appleton, Harold L.; and Kingston, Douglas R., to Appleton-Kingston, Inc. Modular plane surface display structure. 4,275,520, Cl. 40-605.000.

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Appleton Papers Inc.: *See*—
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Arcamone, Federico: *See*—
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Arena-Ochoa, Guido. Gas discharge lamp employing a pulse generator with a double stage amplification circuit. 4,276,496, Cl. 315-206.000.

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Armour and Company: *See*—
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Armstrong World Industries, Inc.: *See*—
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Arnold Engineering Company, The: *See*—
Artaud, Gerard P.; Schrader, Clarence O.; and Reinke, George W., 4,275,655, Cl. 101-123.000.

Aronson, Harvey G. Fluid control system. 4,275,766, Cl. 138-37.000.

Artaud, Gerard P.; Schrader, Clarence O.; and Reinke, George W., to Arnold Engineering Company, The. Method and apparatus for screen printing registered images on opposite sides of a web. 4,275,655, Cl. 101-123.000.

Arthur D. Little, Inc.: *See*—
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Arzubi, Luis M.; Clemen, Rainer; and Gschwendtner, Jorg, to International Business Machines Corporation. FET driver circuit with short switching times. 4,276,487, Cl. 307-270.000.

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Asplund, Arne J. A. Apparatus for controlling the refining of fibrous pulp grist in a drum refiner. 4,275,852, Cl. 241-259.200.

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Atwood, John E.; Baugh, John L.; Koehler, William M.; and Waterman, David K., to McMurry-Hughes, Inc. Extractor tool and holder. 4,275,592, Cl. 73-432.00R.

Aubert, Jean. Installation for accelerating navigation of a water ramp and method relating thereto. 4,275,973, Cl. 405-86.000.

Ault, Russell L., to Owens-Corning Fiberglas Corporation. Method of making and using molds for longitudinally curved sections of pipe insulation. 4,276,245, Cl. 264-46.500.

Aurell, Leif E.: *See*—
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Badger, Everett H.; and Rogerson, Michael J., to Rogerson Aircraft Controls. Vacuum-flush toilet arrangement for aircraft. 4,275,470, Cl. 4-316.000.

Baer, Stephen C. Sun tracking device employing displaced heating surfaces for automatic morning reorientation. 4,275,712, Cl. 126-425.000.

Bahr, Albert; and Kues, Joachim, to Bahr, Albert. Process for the treatment of aluminum-salt slags. 4,275,847, Cl. 241-20.000.

Baima, Mario; and Tavoni, Gian P., to Centro Ricerche Fiat S.p.A. Device for keeping under control a population of selected species of insects. 4,275,523, Cl. 43-112.000.

Baird, Roy W.; Berger, Robert E.; and Kirk, Richard L., to Goodyear Aerospace Corporation. Non-frangible wheel. 4,275,932, Cl. 301-39.00T.

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Baker, Christopher J. Seed sowing implements. 4,275,671, Cl. 111-85.000.

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Bakos, Peter; Bendz, Gerald A.; Darrow, Russell E.; and Rivenburgh, Dennis L., to International Business Machines Corporation. Cleaning composition and use thereof. 4,276,186, Cl. 252-158.000.

Bale, Alain, to C.B.M. Car et Bus Le Mans. Control device for motor road vehicle automatic change-speed transmission mechanism. 4,275,618, Cl. 74-878.000.

Balke, Rodney W.: *See*—
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Barcelo Rubi, Bartolome. System of solar heating by means of fan radiators with fluid circuit and without storage. 4,275,709, Cl. 126-422.000.

Baret, Denis, to Berthoud, S.A. Combination pressure regulator and manual on-off valve. 4,275,764, Cl. 137-614.190.

Barker, Glenn B.; and Coburn, William K., III, to Standard-Thomson Corporation. Carburetor air control device. 4,276,237, Cl. 261-39.00A.

Barna, Stephen L. Kitchen utensil for making flavored beverages. 4,275,646, Cl. 99-323.000.

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Baroni, Dante; and Baroni, Adelelmo. Mobile apparatus adapted to form a duct for liquid flows, particularly for irrigation purposes. 4,275,837, Cl. 239-197.000.

Barr, John B.; and White, Nicholas F., III, to Union Carbide Corporation. Spin size and thermosetting aid for pitch fibers. 4,276,278, Cl. 423-447.400.

Barth, Wayne E., to Pfizer Inc. Combinations of penicillanic acid 1,1-dioxide with 7-(D-2-[4-ethylpiperazin-2,3-dione-1-carboxamido]-2-[4-hydroxyphenyl]acetamido)-3-([1-methyl-5-tetrazolyl]thiomethyl)-3-desacetoxymethylcephalosporanic acid. 4,276,285, Cl. 424-114.000.

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BASF Aktiengesellschaft: *See—*
Juenemann, Werner; Lamm, Gunther; and Loeffler, Hermann, 4,276,045, Cl. 8-471.000.
Kilpper, Gerhard; and Grimmer, Johannes, 4,276,433, Cl. 562-458.000.
Petersen, Harro; Krause, Hans-Joachim; Fischer, Kurt; Segnitz, Adolph; and Zaunbrecher, Horst, 4,276,209, Cl. 260-28.00P.
Schoettle, Klaus; Hoffmann, Werner; Kaemmer, Eduard; Boehlke, Klaus; and Lewin, Helmut, 4,276,575, Cl. 360-130.210.

BASF Wyandotte Corporation: *See—*
Schmolka, Irving R.; and Niu, Joseph H. Y., 4,276,054, Cl. 44-51.000.

Bassan, Benjamin, to Varian Associates, Inc. Oil flow metering structure for oil sealed mechanical vacuum vane pump. 4,276,005, Cl. 418-13.000.

Bastgen, Wendel, to Alb. Klein GmbH & Co. KG. Device for dewatering sludge. 4,276,168, Cl. 210-396.000.

Batzel, Stephen E. Vehicle with variable height control station. 4,275,800, Cl. 180-317.000.

Baudet, Pierre, to Societe de Recherches et de Syntheses Organiques S.A. Cyano-guanidine geometrical isomers. 4,276,421, Cl. 548-342.000.

Bauer, Hartmut; Schmidt, Peter; Stocker, Herbert; and Przybyla, Bernd, to Robert Bosch GmbH. Device for determining a fuel metering signal for an internal combustion engine. 4,275,695, Cl. 123-486.000.

Baugh, John L.: *See—*
Atwood, John E.: Baugh, John L.; Koehler, William M.; and Waterman, David K., 4,275,592, Cl. 73-432.00R.

Bausch & Lomb Incorporated: *See—*
Chromecek, Richard C.; Deichert, William G.; Falcetta, Joseph J.; and VanBuren, Martin F., 4,276,402, Cl. 526-264.000.

Baxter Travenol Laboratories, Inc.: *See—*
Cobean, Richard W., 4,276,333, Cl. 428-36.000.
Norton, William W.; Stansbeary, Jack L.; Clemens, Johann; and Earl, Roscoe T., 4,275,480, Cl. 17-25.000.

Bayer Aktiengesellschaft: *See—*
Arlt, Klaus-Peter; Grigo, Ulrich; and Binsack, Rudolf, 4,276,193, Cl. 252-429.00B.
Bockmann, Walter; Lipper, Karl-August; and Bruhne, Friedrich, 4,276,231, Cl. 260-544.00D.
Dieterich, Dieter, 4,276,044, Cl. 8-115.500.
Fuchs, Rainer; Hammann, Ingeborg; and Stendel, Wilhelm, 4,276,306, Cl. 424-304.000.
Hardt, Dietrich; Humme, Gert; Ott, Karl-Heinz; and Braese, Hans-Eberhard, 4,276,391, Cl. 525-71.000.
Hendricks, Udo-Winfried; and Jakobs, Karlhans, 4,276,046, Cl. 8-532.000.
Hohlein, Peter; and Schoeps, Jochen, 4,276,210, Cl. 260-29.4UA.
Juffa, Richard; and Boden, Heinrich, 4,275,822, Cl. 222-63.000.
Lantzsch, Reinhard, 4,276,218, Cl. 260-343.600.
Lantzsch, Reinhard; and Hoffmann, Hellmut, 4,276,225, Cl. 260-408.000.
Schnegg, Peter; Rapp, Walter; and Vosteen, Bernhard, 4,276,431, Cl. 560-67.000.
Scholl, Hans-Joachim; Dieterich, Dieter; and Markusch, Peter, 4,276,404, Cl. 528-57.000.
Schwindt, Jurgen; and Grogler, Gerhard, 4,276,386, Cl. 521-160.000.
Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; Krehan, Ingomar; Kraus, Peter; and Stendel, Wilhelm, 4,276,310, Cl. 424-322.000.
Wieder, Wolfgang; Witte, Josef; Moretto, Hans-Heinrich; and Steinberger, Helmut, 4,276,389, Cl. 525-61.000.

Bayer, Dean M., to General Motors Corporation. Multisectioned cellular energy-absorbing unit and mounting therefor. 4,275,912, Cl. 293-120.000.

Bazzea, Cesare, to I.M.I. Industria Macchine Idrauliche S.p.A. Toggle action closing and locking devices for presses. 4,276,013, Cl. 425-451.500.

BBC Brown, Boveri & Company, Limited: *See—*
Buhler, Karl, 4,276,082, Cl. 75-10.00R.
Starcevic, Mihailo, 4,275,936, Cl. 308-73.000.

Beales, Keith J.; Duncon, William J.; Dunn, Anthony G.; and Newns, George R., to Post Office, The. Optical fibres and glasses. 4,275,951, Cl. 350-96.310.

Beatrice Foods Co.: *See—*
Schwitters, Stephen W., 4,275,567, Cl. 62-63.000.

Beck, Christa, Thoms Beck, and Matthias Beck, heirs: *See—*
Beck, Rudolf K., deceased, 4,275,565, Cl. 62-55.000.

Beck, Martin A.; Fabricius, John H.; and Landis, Donald G., to BTU Engineering Corporation. Diffusion furnace microcontroller. 4,276,603, Cl. 364-477.000.

Beck, Rudolf K., deceased (by Beck, Christa, Thoms Beck, and Matthias Beck, heirs), to Siemens Aktiengesellschaft. Transfer device for a cryogenic medium. 4,275,565, Cl. 62-55.000.

Becker, Frank C.; and Li, Jorge P., to Abbott Laboratories. Method for protecting industrial substrates from fungal or bacterial attack. 4,276,090, Cl. 106-18.320.

Becker, Hans; Grimm, Peter; Ranke, Gerhard; and Roth, Dieter, to Linde Aktiengesellschaft. Process for treating pressurized gases to remove unwanted components. 4,276,057, Cl. 55-40.000.

Becker, Howard W. Hydraulically operated flush valve for toilet flush tanks and similar devices. 4,275,471, Cl. 4-387.000.

Beckman Instruments, Inc.: *See—*
Hansen, Paul L., 4,276,593, Cl. 364-119.000.
Hawkins, John J., 4,276,141, Cl. 204-195.00M.

Beckworth, Alden E.: *See—*
Hutson, Thomas, Jr.; Makovec, Donald J.; and Beckworth, Alden E., 4,276,439, Cl. 585-720.000.

Becton, Dickinson and Company: *See—*
Akerkar, Anandrao S.; and Rutner, Herman, 4,276,280, Cl. 424-1.000.
Hussein, Hany M., 4,275,730, Cl. 128-234.000.
Wand, Bruce, 4,275,591, Cl. 73-425.40P.

Beebe, Otto W.; Lee, Ernest O.; Subrin, Richard I.; Brightman, Barrie; and Hanson, George C., to Stromberg-Carlson Corporation. Control system for telephone switching system. 4,276,451, Cl. 179-175.20C.

Behrstock, Barry. Endotracheal intubation device. 4,275,724, Cl. 128-207.140.

Beiersdorf AG: *See—*
Geisler, Diether; and Eckert, Joachim, 4,275,525, Cl. 46-39.000.

Beilstein, Kenneth E., Jr.; and Kotecha, Harish N., to International Business Machines Corporation. Method of making a MOSFET device with reduced sensitivity of threshold voltage to source to substrate voltage variations. 4,276,095, Cl. 148-1.500.

Beimgraben, Herbert W.; and Reinhardt, Paul A., to Baker International Corporation. Fluid pressure actuated by-pass and relief valve. 4,275,795, Cl. 175-26.000.

Beirute, Robert M., to Western Company of North America, The. High temperature cement mud spacer. 4,276,182, Cl. 252-8.55R.

Bell, George E.; Wilson, Clement B.; Thibado, Daniel H.; and Palumbo, Kenneth S., to Xerox Corporation. Developing apparatus. 4,275,956, Cl. 355-3.0DD.

Bell & Howell Company: *See—*
Akers, Roy, 4,275,875, Cl. 271-5.000.
Rady, Bruce A.; Wells, Thomas R.; and Hendrickson, Kenneth, 4,276,470, Cl. 235-463.000.

Bell, John T.; and Bender, Max E., to Container Corporation of America. Stitching machine for preformed containers. 4,276,042, Cl. 493-118.000.

Bell Telephone Laboratories, Incorporated: *See—*
Embree, Milton L.; Goldthorp, David C.; and Vogelpohl, David R., 4,276,448, Cl. 179-84.00T.
Heller, Adam; Tai, King L.; and Vadimsky, Richard G., 4,276,368, Cl. 430-323.000.
Levinstein, Hyman J.; Murarka, Shyam P.; and Sinha, Ashok K., 4,276,557, Cl. 357-67.000.
Nelson, Ronald J.; and Wright, Phillip D., 4,276,098, Cl. 148-171.000.
Nelson, Terence J.; and Wolfe, Raymond, 4,276,614, Cl. 365-36.000.

Bello, Ernesto: *See—*
Drbal, Vladimir J.; Ginsberg, Guenter; Hodgins, Bruce J.; Richardson, John A.; Britton, Ted W.; Grimm, Richard M.; Bello, Ernesto; Rodriguez, Rodolfo R.; and Saltz, Ivan K., 4,276,260, Cl. 422-100.000.

Belofsky, Harold, to Parker-Hannifin Corporation. Hose with braided reinforcement. 4,275,937, Cl. 308-127.000.

Bench, Stephen M.; Dirkes, William R.; Juglekar, Manohar A.; Secora, James C.; and Stephen, Michael A., to Motorola, Inc. Clock circuitry for a data communication system. 4,276,651, Cl. 375-120.000.

Bender, Max E.: *See*—
Bell, John T.; and Bender, Max E., 4,276,042, Cl. 493-118.000.
Bendix Corporation, The: *See*—
Gallusser, David O.; Hemmer, Valentine J.; and Toombs, Gary C., 4,275,948, Cl. 339-218.00R.
Hartford, Thomas W.; and Kessler, James A., 4,276,600, Cl. 364-431.000.
Krantz, Leonard A.; and Hogan, Edward P., 4,275,945, Cl. 339-147.00R.
Perkey, Russell C.; Thoman, David C.; and Eastman, James M., 4,276,006, Cl. 418-94.000.
Bendz, Gerald A.: *See*—
Bakos, Peter; Bendz, Gerald A.; Darrow, Russell E.; and Rivenburgh, Dennis L., 4,276,186, Cl. 252-158.000.
Benedict, Douglas M.; and Gaskill, James R., Jr., to Hughes Aircraft Company. Multi-master single-slave ECL flip-flop. 4,276,488, Cl. 307-272.00A.
Benke, Frank W.; and Moore, Curtis L., to Electric Power Research Institute, Inc. Vapor-cooled electrical apparatus. 4,276,530, Cl. 336-58.000.
Bentley, Glenn E.; and Barnes, John W., to United States of America, Energy. Hot cell purification of strontium-82, 85 and other isotopes from proton irradiated molybdenum. 4,276,267, Cl. 423-2.000.
Berger, Robert E.: *See*—
Baird, Roy W.; Berger, Robert E.; and Kirk, Richard L., 4,275,932, Cl. 301-39.00T.
Bergkvist, Lars A. Uncoiling and coiling tape measure. 4,275,503, Cl. 33-137.00R.
Bergman, Charles T., to Brandt, Inc. Coin sorter with expanded capability. 4,275,751, Cl. 133-3.00C.
Bergman, Raymond A. Air float fixture clamping system. 4,275,983, Cl. 414-676.000.
Bergner, Robert L.; Rothwarf, Frederick; and Tauber, Arthur, to United States of America, Army. Method of treating Sm_2Co_{17}-based permanent magnet alloys. 4,276,097, Cl. 148-101.000.
Bergsten, M. Brian, to United States of America, Air Force. Cooling system for ramjet engine. 4,275,857, Cl. 244-53.00B.
Bergwerksverband GmbH: *See*—
Gappa, Gunther; Juntgen, Harald; and Klein, Jurgen, 4,276,178, Cl. 210-662.000.
Bernd, Steinkuhl: *See*—
Merten, Gerhard; Breuer, Oswald; and Bernd, Steinkuhl, 4,275,927, Cl. 299-34.000.
Bernert, Jorg D.: *See*—
de Groot, Fredrik W.; and Bernert, Jorg D., 4,275,802, Cl. 188-134.000.
Berry, Victor L.: *See*—
Andrews, James R.; Balke, Rodney W.; and Berry, Victor L., 4,275,992, Cl. 416-146.00R.
Berthoud, S.A.: *See*—
Baret, Denis, 4,275,764, Cl. 137-614.190.
Bichi, Pasquale, to Gori & Zucchi S.p.A. Machine and a method for constructing a chain having automatically shaped and welded chain links. 4,275,555, Cl. 59-3.000.
Bilanceri, Silvio G., to Black & Decker Inc. Self-tightening keyless chuck. 4,275,893, Cl. 279-64.000.
Bilhorn, John M., to Yardney Electric Corporation. Method of forming a separator integral with an electrode. 4,276,110, Cl. 156-298.000.
Bilow, Norman; and Landis, Abraham L., to Hughes Aircraft Company. Acetylene terminated imide oligomers which melt at low temperatures. 4,276,407, Cl. 528-172.000.
Binder, Kurt: *See*—
Gast, Theodor; and Binder, Kurt, 4,275,586, Cl. 73-35.000.
Binks Manufacturing Company: *See*—
Gerdes, Donald F., 4,276,064, Cl. 55-217.000.
Binsack, Rudolf: *See*—
Arlt, Klaus-Peter; Grigo, Ulrich; and Binsack, Rudolf, 4,276,193, Cl. 252-429.00B.
Bio-Vac Incorporated: *See*—
Parkinson, Martin; and Dimitroff, Michael V., 4,275,511, Cl. 34-92.000.
Biotechnologie Aktiengesellschaft fur Emulsan: *See*—
Gutnick, David L.; and Rosenberg, Eugene, 4,276,094, Cl. 134-10.000.
Bishop, Gerald B., to Ford Motor Company. Carburetor. 4,276,240, Cl. 261-52.000.
Bissell, Reeder E., to Eastman Kodak Company. Olefin polymerization process using pretreated catalyst. 4,276,400, Cl. 526-152.000.
Bivins, Charles F. Method and apparatus for securing calvarium skull section to basal skull section. 4,275,490, Cl. 27-21.000.
BJ-Hughes Inc.: *See*—
Sweatman, Ronald E., 4,275,788, Cl. 166-292.000.
Black Clawson Company, The: *See*—
Lehman, Donald F., 4,276,159, Cl. 209-273.000.
Black & Decker Inc.: *See*—
Bilanceri, Silvio G., 4,275,893, Cl. 279-64.000.
Black & Decker Manufacturing Company, The: *See*—
Speer, Howard D., Jr.; and Proett, Mark A., 4,275,500, Cl. 30-40.000.
Black, William B.: *See*—
Wu, Wen-li; and Black, William B., 4,276,348, Cl. 428-373.000.
Blair, Lynn J., to General Electric Company. Retractable igniter device for gas turbines. 4,275,559, Cl. 60-39.82S.
Blanchard, Roland H., to Winthrop-Atkins Co., Inc. Photograph mount. 4,275,517, Cl. 40-158.00R.
Blanchard, Ronald J.: *See*—
Dissly, Donald D.; and Blanchard, Ronald J., 4,276,597, Cl. 364-300.000.
Blaser, Lawrence M.: *See*—
Arguello, Leonard E.; and Blaser, Lawrence M., 4,275,701, Cl. 123-609.000.
Bleday, Michael P., to United States of America, Air Force. Optical dome protection device. 4,275,859, Cl. 244-121.000.
Blight, Graham J.: *See*—
Stager, Robert F.; and Blight, Graham J., 4,276,498, Cl. 318-6.000.
Blohm, Reinhard; Karl, Rupert; and Sarcander, Hans, to Schubert & Salzer. Process and apparatus for servicing a number of mutually adjacent spinning positions of an open-end spinning machine. 4,275,553, Cl. 57-263.000.
Bludworth, Robert A. Coupling apparatus for articulated bodies. 4,275,678, Cl. 114-248.000.
Blumrich, Walter; Dorr, Karl H.; Konig, Hans J.; and Sander, Ulrich, to Metallgesellschaft Aktiengesellschaft. Process of strengthening dilute phosphoric acid. 4,276,116, Cl. 159-47.00R.
Bly, Kenneth B.; Gutwald, Mark J.; and Ludecke, Otto A., to General Motors Corporation. Monolith diesel exhaust filter with self-regeneration. 4,276,066, Cl. 55-287.000.
Bo, Ermanno, to Societe Anonyme Dite BBM. Marking head for cold stamping symbols on a metallic surface. 4,275,652, Cl. 101-4.000.
Boano, Adolfo: *See*—
Andreoli, Angelo; Boano, Adolfo; and Vesco, Mario, 4,275,900, Cl. 280-710.000.
Bockmann, Walter; Lipper, Karl-August; and Bruhne, Friedrich, to Bayer Aktiengesellschaft. Process for the preparation of optionally substituted benzoyl chloride. 4,276,231, Cl. 260-544.00D.
Boden, Heinrich: *See*—
Juffa, Richard; and Boden, Heinrich, 4,275,822, Cl. 222-63.000.
Bodig, Bernd; Roozenbeek, Herman; and Jundt, Werner, to Robert Bosch GmbH. Flux control system for a hall generator in an ignition system of an internal combustion engine. 4,275,703, Cl. 123-617.000.
Boehlke, Klaus: *See*—
Schoettle, Klaus; Hoffmann, Werner; Kaemmer, Eduard; Boehlke, Klaus; and Lewin, Helmut, 4,276,575, Cl. 360-130.210.
Boehringer Mannheim GmbH: *See*—
Hundt, Dieter; Sedelmeyer, Marianne; Roschlau, Peter; Stahler, Fritz; and Gruber, Wolfgang, 4,276,376, Cl. 435-17.000.
Boeing Company, The: *See*—
Kalocsay, Joseph, 4,275,603, Cl. 73-861.680.
Steidl, Robert H., 4,275,942, Cl. 312-266.000.
Tomlinson, Lloyd R., 4,276,648, Cl. 371-68.000.
Boekhorst, Antonius, to U.S. Philips Corporation. Tuned switched-mode power supply. 4,276,586, Cl. 363-21.000.
Boes, David J., to Westinghouse Electric Corp. Face type shaft seal for liquid metal pumps. 4,275,891, Cl. 277-96.100.
Bogner, Robert E.: *See*—
Eshraghian, Kamran; and Bogner, Robert E., 4,276,539, Cl. 340-38.00L.
Bogusky, Ronald A.: *See*—
Holmes, Phillip R.; Kehler, James A.; and Bogusky, Ronald A., 4,275,572, Cl. 64-30.00D.
Bohman, Carl E.; and Mitchell, Peter G., to Sperry Corporation. Stone discriminator. 4,275,546, Cl. 56-10.200.
Boisen Schmidt, Egon; Zechner, Josef K. S.; and Frang, Gosta M., to Boliden Aktiebolag. Method of crystallizing aluminium sulphate solutions to form dust-free granules having uniform grain size. 4,276,052, Cl. 23-301.000.
Bolcavage, Richard D.; Fleek, Arthur E.; and Marcus, Mitchell P., to International Business Machines Corporation. Line printer system and method of operation with microprocessor control. 4,275,653, Cl. 101-93.140.
Bolesky, Richard C., to Zimmer USA, Inc. Intramedullary fixation device for fractured tubular bones. 4,275,717, Cl. 128-92.0BC.
Boliden Aktiebolag: *See*—
Boisen Schmidt, Egon; Zechner, Josef K. S.; and Frang, Gosta M., 4,276,052, Cl. 23-301.000.
Bolliger, Frederic E.: *See*—
Hatch, Robert A.; Jansen, Harvey B.; Bolliger, Frederic E.; and Sumegi, Robert B., 4,275,558, Cl. 60-39.16R.
Bolton, Colin B.; Rylands, Harry D.; Turner, Clara; and Turner, Henry W., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Panel breaking systems. 4,275,858, Cl. 244-121.000.
Bommart, Patrick, to Delachaux, C. Apparatus for removing the surplus welding material. 4,275,499, Cl. 30-180.000.
Bonanno, Anthony J.: *See*—
Greenfield, Charles; and Bonanno, Anthony J., 4,276,115, Cl. 159-1.0RW.
Bonn, John W., to Pennwalt Corporation. Cryopump apparatus. 4,275,566, Cl. 62-55.500.
Bonus-Bilt, Inc.: *See*—
Silverman, Richard V., 4,275,665, Cl. 108-14.000.
Bonzom, Albert; Crepaux, Alain P.; and Moutard, Anne-Marie E. J., to British Petroleum Company Limited, The. Process for preparing pitch foams and products so produced. 4,276,246, Cl. 264-53.000.
Boothroyd, John A.: *See*—
Willett, Daniel E.; Boothroyd, John A.; and Langlais, William F., 4,276,459, Cl. 200-157.000.
Bopp, Louis A., to General Cable Corporation. Power and control cables having flexible polyolefin insulation. 4,276,251, Cl. 264-174.000.

Boreas, Willem J. L., to Sangamo Weston, Inc. Magnetic systems for long scale electrical meter with multiple side coil sensing. 4,276,511, Cl. 324-150.000.

Borg-Warner Corporation: *See—*
Falk, John C., 4,276,393, Cl. 525-233.000.
Kountz, Kenneth J.; and Norbeck, Dean K., 4,275,987, Cl. 415-17.000.

Bose, Bimal K., to General Electric Company. Microcomputer-based control apparatus for a load-commutated inverter synchronous machine drive system. 4,276,505, Cl. 318-723.000.

Boser, Ronald J.; Watts, Henry J.; and Siegel, Walter P., deceased (by Siegel, Dorothy, executrix), to Union Special Corporation. Apparatus employed in the attachment of hook and eye tape portions to a brassiere. 4,275,673, Cl. 112-105.000.

Bothwell, Bruce E., to Repwell Associates, Inc. Metal-ceramic composite and method for making same. 4,276,331, Cl. 428-36.000.

Boudrot, Robert J.; Shambaugh, John S.; and Zeltzer, Hyman, to GTE Products Corporation. Electrochemical cell with electrode holddown. 4,276,361, Cl. 429-186.000.

Bounds, Edward G. Building foundation method and system, with energy conservation and solar energy utilization features. 4,275,538, Cl. 52-299.000.

Bourne, John W., to Bourne, Joyce Anne. Rotary valves. 4,275,824, Cl. 222-148.000.

Bourne, Joyce Anne: *See—*
Bourne, John W., 4,275,824, Cl. 222-148.000.

Boutcher, Andrew G., Jr.; and Shatto, Walter C., Jr., to AMP Incorporated. Connector terminating tool. 4,275,495, Cl. 29-749.000.

Boutros, Kamal S.; and Coleman, Michael J., to Bunker Ramo Corporation. High density filter connector. 4,276,523, Cl. 333-182.000.

Bowen, Andrew C.: *See—*
Bowen, Michael W.; and Bowen, Andrew C., 4,275,972, Cl. 403-401.000.

Bowen, Howard; and Little, John S., to Research Technology, Inc. Film thickness detection system. 4,276,547, Cl. 340-675.000.

Bowen, Michael W.; and Bowen, Andrew C. Mitre joint and fastener therefor. 4,275,972, Cl. 403-401.000.

Bower, John D. Regeneratable peritoneal dialysis bag. 4,276,175, Cl. 210-636.000.

Bowman, Robert M., to Ciba-Geigy Corporation. Benzofurylpiperazines. 4,276,294, Cl. 424-250.000.

BP Chemicals Limited: *See—*
Tenhagen, Rudolf J., 4,276,385, Cl. 521-112.000.

Brabazon, Jack A. Full span shipboard fueling system for aircraft. 4,275,860, Cl. 244-135.00R.

Braese, Hans-Eberhard: *See—*
Hardt, Dietrich; Humme, Gert; Ott, Karl-Heinz; and Braese, Hans-Eberhard, 4,276,391, Cl. 525-71.000.

Brain, Sally A.: *See—*
Robinson, Joseph G.; and Brain, Sally A., 4,276,408, Cl. 528-247.000.

Bramwell, Michael J., to Imperial Chemical Industries Limited. Thermoplastics articles having a surface fused to cloth. 4,276,346, Cl. 428-286.000.

Brancolini, Emiliano, to Fiat Trattori S.p.A. Gearbox for an agricultural tractor. 4,275,608, Cl. 74-15.630.

Brandt, Inc.: *See—*
Bergman, Charles T., 4,275,751, Cl. 133-3.00C.

Brandt-Pra, Inc.: *See—*
DiBlasio, John A., 4,275,874, Cl. 271-4.000.

Brechbuhler, Hans U.; Mattern, Gunter; and Traber, Walter, to Ciba-Geigy Corporation. Miticidal 2-(phenoxy-alpha-alkyl)-imidazolines. 4,276,302, Cl. 424-273.00R.

Breider, Edmund J.; and Drnevich, Raymond F., to Union Carbide Corporation. Control of sludge temperature in autothermal sludge digestion. 4,276,174, Cl. 210-613.000.

Brennan, Thomas F.: *See—*
Schaeffer, Friedrich K.; and Brennan, Thomas F., 4,276,102, Cl. 156-85.000.

Brereton, David A.; and Stansbury, Buddy F., to International Business Machines Corporation. Microinstruction storage units employing partial address generators. 4,276,595, Cl. 364-200.000.

Breuer, Oswald: *See—*
Merten, Gerhard; Breuer, Oswald; and Bernd, Steinkuhl, 4,275,927, Cl. 299-34.000.

Brewer, Arthur D.; Neidermyer, Robert W.; and McIntire, William S., to Uniroyal, Inc.; and Uniroyal Ltd. Substituted dithiin tetroxide plant growth regulants. 4,276,422, Cl. 549-15.000.

Brewer, James E.: *See—*
Ahuja, Arjan D.; and Brewer, James E., 4,276,486, Cl. 307-252.00B.

Bridges, Chester L. Snow chain release. 4,275,486, Cl. 24-73.0CE.

Bridgestone Tire Co., Ltd.: *See—*
Yamamoto, Megumi, 4,275,770, Cl. 138-133.000.

Briggs, Louis H. Table saw carriage attachment. 4,275,777, Cl. 144-138.000.

Brightman, Barrie: *See—*
Beebe, Otto W.; Lee, Ernest O.; Subrin, Richard I.; Brightman, Barrie; and Hanson, George C., 4,276,451, Cl. 179-175.20C.

Brink, Robert E.: *See—*
Karnofsky, George B.; and Brink, Robert E., 4,276,021, Cl. 432-85.000.

British Broadcasting Corporation: *See—*
Dalton, Christopher J.; and Roe, Graham D., 4,276,565, Cl. 358-140.000.

British Petroleum Company Limited, The: *See—*
Bonzom, Albert; Crepaux, Alain P.; and Moutard, Anne-Marie E. J., 4,276,246, Cl. 264-53.000.
Veal, Christopher J.; and Wall, Derek R., 4,276,053, Cl. 44-51.000.

Britton, Ted W.: *See—*
Drbal, Vladimir J.; Ginsberg, Guenter; Hodgins, Bruce J.; Richardson, John A.; Britton, Ted W.; Grimm, Richard M.; Bello, Ernesto; Rodriguez, Rodolfo R.; and Saltz, Ivan K., 4,276,260, Cl. 422-100.000.

Broacha, Firoze H.: *See—*
Sivachenko, Eugene W.; and Broacha, Firoze H., 4,275,663, Cl. 105-413.000.

Broghammer, Rudolf; and Kaser, Franz, to Kundo - Kieninger + Obergfell. Bell-striking clock. 4,276,625, Cl. 368-75.000.

Brokke, Mervin E.: *See—*
Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., 4,276,078, Cl. 71-88.000.

Brooks, Frank P.: *See—*
Brooks, Norman B.; and Brooks, Frank P., 4,275,978, Cl. 414-156.000.

Brooks, Norman B.; and Brooks, Frank P. Transport apparatus. 4,275,978, Cl. 414-156.000.

Brown, Byron R., to International Business Machines Corporation. Close-packed bubble propagation device. 4,276,613, Cl. 365-14.000.

Brown, Galen K.: *See—*
Peterson, Donald L.; Srivastava, Ajit K.; and Brown, Galen K., 4,275,649, Cl. 100-4.000.

Brown, Richard E.; Puchalski, Chester; and Shavel, John, Jr., to Warner-Lambert Company. Substituted benzopyrano[3,4-c]pyridines, compositions and use thereof. 4,276,296, Cl. 424-256.000.

Brown & Root, Inc.: *See—*
Stager, Robert F.; and Blight, Graham J., 4,276,498, Cl. 318-6.000.

Brown, Stuart I. Prevention of collagenase induced disease by treatment with collagenase inhibitors. 4,276,284, Cl. 424-101.000.

Browne, Paul A.; and Morton, Robert W., to Dorr-Oliver Incorporated. Drainage deck assembly for rotary vacuum drum filter. 4,276,169, Cl. 210-404.000.

Browning, Vernon D.: *See—*
Riggs, E. Gray; Simmonds, Joseph K.; and Browning, Vernon D., 4,275,768, Cl. 138-104.000.

Bruce, Joseph R.: *See—*
Henneman, Richard C.; Burdon, Kenneth A.; and Bruce, Joseph R., 4,275,870, Cl. 254-361.000.

Bruhn, Larry C., to LBF Properties, Inc. Vehicle mounted motorcycle carrier. 4,275,981, Cl. 414-462.000.

Bruhne, Friedrich: *See—*
Bockmann, Walter; Lipper, Karl-August; and Bruhne, Friedrich, 4,276,231, Cl. 260-544.00D.

Brun, Didier; Chrysostome, Gerard; Feugier, Alain; and Sale, Bernard, to Institut Francais du Petrole; and Societe Heurtey Effiutherm. Process for recovering metal elements from carbonaceous products. 4,276,266, Cl. 423-1.000.

Brunninger, Manfred: *See—*
Theurer, Josef; and Brunninger, Manfred, 4,275,659, Cl. 104-2.000.

Bryant, Lovell D.; and Koontz, Harry S., to PPG Industries, Inc. Probe for testing conductor of an antenna windshield. 4,276,509, Cl. 324-51.000.

Bschorr, Oskar, to Messerschmitt-Boelkow-Biohm Gesellschaft mit beschrankter Haftung. Noise and heat insulating structural component. 4,275,801, Cl. 181-290.000.

BTU Engineering Corporation: *See—*
Beck, Martin A.; Fabricius, John H.; and Landis, Donald G., 4,276,603, Cl. 364-477.000.

Buchholz, Matthew: *See—*
Chen, Gilbert K.; Nyberg, Paul M.; and Buchholz, Matthew, 4,276,242, Cl. 261-111.000.

Buchholz, Rainer: *See—*
Mohn, Hans-Werner; Buchholz, Rainer; Hoveler, Egon; and Zodrow, Rudolf, 4,275,807, Cl. 198-344.000.

Buckingham, Henry L. Security seals. 4,275,911, Cl. 292-315.000.

Buckminster, William F.: *See—*
Garvey, Francis J.; and Buckminster, William F., 4,275,809, Cl. 198-624.000.

Budish, Joseph D. Door latch. 4,275,910, Cl. 292-57.000.

Buhler, Karl, to BBC Brown, Boveri & Company, Limited. Process for the heating and/or melting of metals and an induction furnace to carry out the process. 4,276,082, Cl. 75-10.00R.

Buhler-Miag GmbH: *See—*
Gorlitz, Frank Otto, 4,276,158, Cl. 209-255.000.

Bullivant, Kenneth W.; and Schreier, Hermann, to K-Tron International Inc. Interchangeable volumetric screw feeder. 4,275,808, Cl. 198-533.000.

Bunker Ramo Corporation: *See—*
Boutros, Kamal S.; and Coleman, Michael J., 4,276,523, Cl. 333-182.000.

Burbeck, Ronald N.; and Keightley, Michael R., to J. K. Lasers Limited. Laser flashtube power supply. 4,276,497, Cl. 315-209.00R.

Burdon, Kenneth A.: *See—*
Henneman, Richard C.; Burdon, Kenneth A.; and Bruce, Joseph R., 4,275,870, Cl. 254-361.000.

Burkhardt, Jurgen; and Louis, Eckhart, to Wacker-Chemie GmbH. Process for preparing cyclic dimethylpolysiloxanes. 4,276,425, Cl. 556-460.000.

Burnett, John, to Lock Light Corporation. Key with light. 4,276,582, Cl. 362-116.000.

Burrows, Ian E.; and Cheney, Peter A., to Mars Limited. Food product and process. 4,276,311, Cl. 426-56.000.
Burson, Nancy; and Schneider, Thomas D., to Burson, Nancy. Method and apparatus for producing an image of a person's face at a different age. 4,276,570, Cl. 358-903.000.
Bushey, Peter S.: *See*—
Orals, David L.; and Bushey, Peter S., 4,275,541, Cl. 52-483.000.
Bussolati, Camillo: *See*—
Carbonato, Gianfranco; and Bussolati, Camillo, 4,275,674, Cl. 112-158.00E.
Butler, Gordon K.; and Jefferson, Robert T., to Cummins Engine Company, Inc. Seal construction. 4,275,889, Cl. 277-42.000.
Butt, Sheldon H.: *See*—
Popplewell, James M.; and Butt, Sheldon H., 4,275,784, Cl. 165-134.00R.
Butylin, Mikhail Y.: *See*—
Anoshko, Vladimir A.; Godin, Eduard M.; Gavrilov, Anatoly N.; Zverkov, Garik E.; Matskevich, Vladimir I.; Chepurin, Valentin M.; Semenov, Valentin P.; Grachev, Vladimir V.; and Butylin, Mikhail Y., 4,275,579, Cl. 72-59.000.
Buzzell, Colby E., to General Electric Company. Vibrator type densitometer. 4,275,585, Cl. 73-32.00A.
C.B.M. Car et Bus Le Mans: *See*—
Bale, Alain, 4,275,618, Cl. 74-878.000.
C. J. Rogers Enterprises Inc.: *See*—
Rogers, Charles J., 4,276,580, Cl. 362-22.000.
C.M. Industries: *See*—
Faisandier, Yves, 4,275,742, Cl. 128-703.000.
Cabardo, Alberto, Jr. Periodontal powder. 4,276,287, Cl. 424-154.000.
Cairns, Rodney J.; and Whitelaw, Stefan P., to National Distillers and Chemical Corporation. Plastic valve core. 4,275,756, Cl. 137-234.500.
California Institute of Technology: *See*—
Perkins, Gerald S.; and Moore, Nicholas R., 4,276,003, Cl. 417-415.000.
Campbell, Frank, Jr. Interlocking truncated triangular insulator. 4,275,771, Cl. 138-149.000.
Canadian Gas Research Institute: *See*—
Schaus, Orland O.; and Overall, John C. K., 4,275,705, Cl. 126-110.00R.
Cannelli, Pierino. Thermoelectric generator operating with a cooling device for converting solar energy into electric energy, and system for the use thereof. 4,276,440, Cl. 136-206.000.
Canon Kabushiki Kaisha: *See*—
Harigaya, Isao; and Yamataka, Akihiro, 4,276,606, Cl. 364-709.000.
Midorikawa, Koyo; Tsunoda, Atsuo; Murase, Hidetoshi; Mochizuki, Noritaka; Minami, Setsuo; Matsui, Yoshiya; Moriwaki, Masazumi; and Suzuta, Mikio, 4,275,962, Cl. 355-1.000.
Tachika, Tetsuji; Sakamaki, Hisashi; and Hattori, Hiroyuki, 4,275,958, Cl. 355-14.00R.
Terasawa, Koji, 4,276,554, Cl. 346-140.00R.
Carasso, Marino G.: *See*—
de Jager, Frank; van Doorn, Rudolf A.; Verboom, Johannes V.; and Carasso, Marino G., 4,276,650, Cl. 375-110.000.
Carbonaro, Mario, to Compagnie Francaise des Petroles. Tool equipped with a percussive device. 4,275,794, Cl. 173-135.000.
Carbonato, Gianfranco; and Bussolati, Camillo, to Necchi S.p.A. Microprocessor controlled electronic sewing machine. 4,275,674, Cl. 112-158.00E.
Carlsen, W. John; Dakss, Mark L.; and Lambert, Gary M., to GTE Laboratories Incorporated. Winged V-groove fiber optic clamp and splicer. 4,276,113, Cl. 156-502.000.
Carlson, David H. J., to UOP Inc. Catalytic composite, method of manufacture, and process for use. 4,276,194, Cl. 252-430.000.
Carnation Company: *See*—
Chambers, Lee; and Ellertson, Melvin E., 4,275,647, Cl. 99-339.000.
Caroli, Celso. Electrically driven continuous tooth brush. 4,275,749, Cl. 132-11.00A.
Carosone, Giorgio. Cigarette holder. 4,275,745, Cl. 131-270.000.
Cassens, Nicholas, Jr., to Kaiser Aluminum & Chemical Corporation. Refractory gun mix. 4,276,091, Cl. 106-58.000.
Cassinelli, Giuseppe; Ruggieri, Daniela; Arcamone, Federico; and di Marco, Aurelio, to Farmitalia Carlo Erba, S.p.A. Antitumor glycosides, their preparation and use. 4,276,289, Cl. 424-180.000.
Castaldo, Jerry L. Lock device. 4,275,577, Cl. 70-337.000.
Castle, George K. Fire proof cable tray enclosure. 4,276,332, Cl. 428-36.000.
Castle, Thomas M.: *See*—
Dolak, Lester A.; Laborde, Alice L.; and Castle, Thomas M., 4,276,412, Cl. 536-17.00R.
Catalyst Research Corporation: *See*—
Harney, Marilyn J., 4,276,362, Cl. 429-213.000.
Caterpillar Tractor Co.: *See*—
Forney, Melvin L., 4,276,464, Cl. 219-136.000.
Grgurich, William A.; Niles, Albert B.; and Updyke, Kenneth W., 4,275,844, Cl. 239-533.300.
Miller, Kenneth J., 4,275,581, Cl. 72-385.000.
Reinsma, Harold L., 4,275,890, Cl. 277-84.000.
Cavitron Corporation: *See*—
Warrin, George E., 4,276,024, Cl. 433-99.000.
Celanese Corporation: *See*—
Dalton, Charles A.; and Slinkard, William E., 4,276,196, Cl. 252-435.000.
Froix, Michael F., 4,276,397, Cl. 525-448.000.
Rhum, David; and Aluotto, Patrick F., 4,276,432, Cl. 560-190.000.
Soehngen, John W., 4,276,179, Cl. 210-679.000.
Cellu Products Company: *See*—
Miller, Alan H., 4,275,811, Cl. 206-204.000.
Centrilift-Hughes, Inc.: *See*—
Roberts, Leo L., 4,275,938, Cl. 308-162.000.
Centro Ricerche Fiat S.p.A.: *See*—
Baima, Mario; and Tavoni, Gian P., 4,275,523, Cl. 43-112.000.
Franco, Bartolo, 4,275,918, Cl. 296-190.000.
Century International Corp.: *See*—
Smith, Ronald L., 4,275,884, Cl. 273-43.00A.
Chamberlain, Alan D., to Sybron Corporation. Sludge siphon collector with de-gasing header. 4,276,165, Cl. 210-242.100.
Chambers, Lee; and Ellertson, Melvin E., to Carnation Company. Apparatus for producing a centerfilled food product. 4,275,647, Cl. 99-339.000.
Chambers, William M. Macerator. 4,275,849, Cl. 241-46.060.
Chan, Chong H.: *See*—
Van Hook, James P.; Hildebrand, Clair E.; and Chan, Chong H., 4,276,276, Cl. 423-385.000.
Chang, George Q.: *See*—
Kohlenberger, Charles W.; Kirkpatrick, Craig G.; Estrada, John A.; and Chang, George Q., 4,275,599, Cl. 73-774.000.
Chapman, Charles C.: *See*—
Dixon, Rolland E.; and Chapman, Charles C., 4,276,257, Cl. 422-62.000.
Chattha, Mohinder S., to Ford Motor Company. Coating composition catalyzed with phosphonic acid derivative - 3. 4,276,392, Cl. 525-118.000.
Chemap A.G.: *See*—
Mueller, Felix, 4,276,384, Cl. 435-311.000.
Muller, Hans; and Guazzone, Bruno, 4,276,166, Cl. 210-327.000.
Chemetals Corporation: *See*—
Welsh, Jay Y.; Mullier, Alain; and Picquet, Pierre C., 4,276,268, Cl. 423-49.000.
Chen, Gilbert K.; Nyberg, Paul M.; and Buchholz, Matthew, to Koch Engineering Company, Inc. Vapor-liquid contact grid apparatus. 4,276,242, Cl. 261-111.000.
Chene, Richard: *See*—
Irio, Francis; and Chene, Richard, 4,275,484, Cl. 24-20.00R.
Cheney, Peter A.: *See*—
Burrows, Ian E.; and Cheney, Peter A., 4,276,311, Cl. 426-56.000.
Chepurin, Valentin M.: *See*—
Anoshko, Vladimir A.; Godin, Eduard M.; Gavrilov, Anatoly N.; Zverkov, Garik E.; Matskevich, Vladimir I.; Chepurin, Valentin M.; Semenov, Valentin P.; Grachev, Vladimir V.; and Butylin, Mikhail Y., 4,275,579, Cl. 72-59.000.
Chester, Arthur W.; and Stover, William A., to Mobil Oil Corporation. Steam passivation of metal contaminants on cracking catalysts. 4,276,149, Cl. 208-120.000.
Chester, Victor, to General Porcelain Mfg. Co. Composition of a conductive ceramic glaze and improved method of forming same. 4,276,204, Cl. 252-519.000.
Chevron Research Company: *See*—
Ziman, Stephen D., 4,276,420, Cl. 548-264.000.
Chiarino, Dario: *See*—
Della Bella, Davide; and Chiarino, Dario, 4,276,299, Cl. 424-272.000.
Chikadel, Burt: *See*—
Leighton, Stephen B.; Murano, Genesio; Markowitz, Allen; and Chikadel, Burt, 4,276,383, Cl. 435-291.000.
Chloride Group Limited: *See*—
Henson, Kenneth; and Terrell, Christopher, 4,276,358, Cl. 429-97.000.
Chodorow, Ingram S.; and Dainow, J. David, to Technalytics, Inc. Retention suture bridge. 4,275,736, Cl. 128-335.000.
Chojnacki, Dennis A.: *See*—
Mayers, Richard R.; Huebner, Steven R.; and Chojnacki, Dennis A., 4,275,569, Cl. 62-373.000.
Choma, Charles J.: *See*—
Choma, John R., 4,275,656, Cl. 101-211.000.
Choma, John R., to Choma, Charles J.; and Choma, Lena G. Bubble printing method. 4,275,656, Cl. 101-211.000.
Choma, Lena G.: *See*—
Choma, John R., 4,275,656, Cl. 101-211.000.
Chontos, Stephen G. Cutting saw measuring attachment. 4,275,504, Cl. 33-138.000.
Chore-Time Equipment, Inc.: *See*—
Little, Hercel A., 4,276,506, Cl. 318-806.000.
Chowaniec, Adam, to Northern Telecom Limited. Method and apparatus for improving telephone hybrid network. 4,276,450, Cl. 179-170.00D.
Christensen, Inc.: *See*—
Higginbotham, Eugene E., 4,275,528, Cl. 51-206.00P.
Chromecek, Richard C.; Deichert, William G.; Falcetta, Joseph J.; and VanBuren, Martin F., to Bausch & Lomb Incorporated. Polysiloxane/acrylic acid/polcyclic esters of methacrylic acid polymer contact lens. 4,276,402, Cl. 526-264.000.
Chrysler Corporation: *See*—
Graham, Kenneth A., 4,275,700, Cl. 123-590.000.
Chrysostome, Gerard: *See*—
Brun, Didier; Chrysostome, Gerard; Feugier, Alain; and Sale, Bernard, 4,276,266, Cl. 423-1.000.
Chu, Chin-Chiun, to Mobil Oil Corporation. Shape selective reactions involving zeolite catalyst modified with group IIIB metal. 4,276,437, Cl. 585-467.000.
Chu, Chin-Chiun, to Mobil Oil Corporation. Shape selective reactions with group IB modified zeolite catalysts. 4,276,438, Cl. 585-467.000.

Chung, Alfred: *See—*
Ryan, James W.; and Chung, Alfred, 4,276,378, Cl. 435-23.000.
Church, Robert F., to Paint Brush Holder Company, The. Paint brush holder and wiper. 4,275,818, Cl. 220-90.000.
Chutter, Reinald J. Surgical blade holder. 4,275,735, Cl. 128-305.000.
Ciaffone, John T., to Warner-Lambert Company. Safety razor blade cartridge. 4,275,498, Cl. 30-47.000.
Ciarcia, Ronald D.; and Owens, Robert L., to General Electric Company. Miniature current limiting circuit breaker. 4,276,526, Cl. 335-35.000.
Ciba-Geigy Corporation: *See—*
Bowman, Robert M., 4,276,294, Cl. 424-250.000.
Brechbuhler, Hans U.; Mattern, Gunter; and Traber, Walter, 4,276,302, Cl. 424-273.00R.
Green, George E., 4,276,352, Cl. 428-473.500.
Jost, Max, 4,276,213, Cl. 260-40.00R.
Karrer, Friedrich, 4,276,401, Cl. 526-263.000.
Kunz, Walter; Eckhardt, Wolfgang; and Hubele, Adolf, 4,276,303, Cl. 424-273.00R.
Meyer, Hans R., 4,276,188, Cl. 252-301.220.
Randell, Donald R.; and Phillips, Emyr, 4,276,224, Cl. 260-371.000.
Rasberger, Michael, 4,276,232, Cl. 260-936.000.
Cibie Projecteurs: *See—*
Deverrewaere, Alain, 4,276,585, Cl. 362-308.000.
Fratty, Hector, 4,276,583, Cl. 362-214.000.
Cincinnati Mine Machinery Company, The: *See—*
Krekeler, Claude B., 4,275,929, Cl. 299-91.000.
Citizen Watch Company Limited: *See—*
Komiyama, Katsuhiko, 4,276,627, Cl. 368-84.000.
Matsumura, Osamu; Kato, Yutaka; Sekiguchi, Tsunetoshi; and Namiki, Ryo, 4,276,629, Cl. 368-86.000.
Nomura, Yasushi, 4,276,628, Cl. 368-85.000.
Clad, L. Susan. Dibber. 4,275,672, Cl. 111-99.000.
Claeson, Karl G.; Aurell, Leif E.; and Simonsson, Leif R., to AB Kabi. Determination of serine proteases. 4,276,375, Cl. 435-13.000.
Clarion Co., Ltd.: *See—*
Nishikawa, Yasuhisa; and Hasumi, Ryoichi, 4,275,606, Cl. 74-10.390.
Usugi, Kikuo, 4,276,508, Cl. 323-354.000.
Clark, Ben L. Self-contained toothbrush. 4,275,750, Cl. 132-84.00B.
Clark-Reliance Corporation, The: *See—*
Winiasz, Michael E., 4,276,354, Cl. 428-582.000.
Clark, Robert L.: *See—*
Jones, Howard; Clark, Robert L.; and Zimmerman, Morris, 4,276,298, Cl. 424-270.000.
Clausen, Peter J. M.: *See—*
Zangenberg, Jan; and Clausen, Peter J. M., 4,275,996, Cl. 417-221.000.
Clayton Dewandre & Co. Ltd.: *See—*
Knowles, James G., 4,275,643, Cl. 91-444.000.
Clemen, Rainer: *See—*
Arzubi, Luis M.; Clemen, Rainer; and Gschwendtner, Jorg, 4,276,487, Cl. 307-270.000.
Clemens, Johann: *See—*
Norton, William W.; Stansbeary, Jack L.; Clemens, Johann; and Earl, Roscoe T., 4,275,480, Cl. 17-25.000.
Clement, Robert A.; and Anderson, Burton C., to Du Pont de Nemours, E. I., and Company. Methyl- and chloro- substituted aromatic diketodiols. 4,276,226, Cl. 260-410.500.
Clements, Harold J., to Frank B. Dehn & Co. Air cushion lifting device. 4,275,869, Cl. 254-89.00H.
Clements, John H.: *See—*
Collier, Nigel A.; and Clements, John H., 4,275,752, Cl. 137-7.000.
Coach and Car Equipment Corporation: *See—*
Harder, Arthur J., Jr., 4,275,925, Cl. 297-444.000.
Coal Industry (Patents) Limited: *See—*
Robinson, Joseph G.; and Brain, Sally A., 4,276,408, Cl. 528-247.000.
Cobean, Richard W., to Baxter Travenol Laboratories, Inc. Apparatus and method for solvent adhesion of coiled tubing, and product produced thereby. 4,276,333, Cl. 428-36.000.
Coburn, William K., III: *See—*
Barker, Glenn B.; and Coburn, William K., III, 4,276,237, Cl. 261-39.00A.
Coca-Cola Company, The: *See—*
Coots, James C.; and Howser, Muir G., 4,275,980, Cl. 414-411.000.
Credle, William S., Jr., 4,275,823, Cl. 222-94.000.
Coerver, Leo E., to General Dynamics. Circulator in a stripline microwave transmission line circuit. 4,276,522, Cl. 333-1.100.
Coffee, Ronald A., to Imperial Chemical Industries Limited. Container for electrostatic spraying of liquids. 4,275,846, Cl. 239-690.000.
Coker, Thomas G.; and LaConti, Anthony B., to General Electric Company. Cell having catalytic electrodes bonded to a membrane separator. 4,276,146, Cl. 204-266.000.
Cole, Branham F. Rolled material guide and cutter. 4,275,827, Cl. 225-77.000.
Coleman, Michael J.: *See—*
Boutros, Kamal S.; and Coleman, Michael J., 4,276,523, Cl. 333-182.000.
Colgate-Palmolive Company: *See—*
Joshi, David, 4,276,326, Cl. 427-220.000.
Collier, Nigel A.; and Clements, John H. Fluid flow apparatus and method. 4,275,752, Cl. 137-7.000.
Collins, Bobby W. V. Torque arm for use with a torque wrench. 4,275,620, Cl. 81-57.390.
Collum, Paulette: *See—*
Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, 4,276,413, Cl. 536-17.00R.
Columbus McKinnon Corporation: *See—*
Stone, Franz T.; and Schreyer, Kenneth D., 4,275,556, Cl. 59-93.000.
Colvin, Robert E.; Douda, Bernard E.; Montgomery, Francis E.; and Short, James E., Jr., to United States of America, Navy. Process for disposing of decoy flare material. 4,276,100, Cl. 149-109.600.
Combronde, Roger, to Plastic Auvergne. Process and mold for producing safety footwear. 4,276,254, Cl. 264-251.000.
Combustion Engineering, Inc.: *See—*
Manning, William P.; Rehm, Stephen J.; and Schmuhl, Jeffrey L., 4,276,271, Cl. 423-226.000.
Commissariat a l'Energie Atomique: *See—*
Andreucci, Pierre; and Moron, Jacques, 4,276,638, Cl. 370-30.000.
Compagnie Francaise des Petroles: *See—*
Carbonaro, Mario, 4,275,794, Cl. 173-135.000.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Le Dieu, Bernard, 4,276,637, Cl. 370-16.000.
Congdon, James S., to National Semiconductor Corporation. Thermal stress reduction in IC power transistors. 4,276,516, Cl. 330-272.000.
Container Corporation of America: *See—*
Bell, John T.; and Bender, Max E., 4,276,042, Cl. 493-118.000.
Convent, Bernard, to Monsanto Company. Synergistic herbicidal composition comprising N-(butoxymethyl)-6'-tert-butyl-2-chloro-o-acetotoluidide and triallate. 4,276,079, Cl. 71-100.000.
Cooke, Horise M., to Stratoflex, Inc. Fireguard for hose assembly. 4,275,769, Cl. 138-109.000.
Coonrod, William C., to Fibergrate Corporation. Reinforced plastic grating articles and continuous process for forming same. 4,276,337, Cl. 428-134.000.
Coots, James C.; and Howser, Muir G., to Coca-Cola Company, The. Apparatus for automatically degassing FIGAL containers. 4,275,980, Cl. 414-411.000.
Copelan, James B.: *See—*
Matovich, Edwin; and Copelan, James B., 4,275,493, Cl. 29-454.000.
Cordier, Michel; Labaquere, Herve; and Saint-Dizier, Gilbert, to Degremont. Process and apparatus for separation by coalescence of emulsions. 4,276,181, Cl. 210-741.000.
Cordis Dow Corp.: *See—*
Kell, Michael J.; and Mahoney, Robert D., 4,276,173, Cl. 210-500.200.
Coronelli, Carolina: *See—*
Parenti, Francesco; Coronelli, Carolina; Tamoni, Giorgio; and Lancini, Giancarlo, 4,276,382, Cl. 435-253.000.
Costantino, Joseph A.; Heberley, Jeffrey R.; Neimark, Jerry; and Weiner, Thomas E., to United States of America, Army. Detector for Q-switched laser radiation. 4,276,472, Cl. 250-214.00B.
Cotic, Dennis J., to General Electric Company. Radiation detector having a unitary free floating electrode assembly. 4,276,476, Cl. 250-385.000.
Coulter Electronics, Inc.: *See—*
Drbal, Vladimir J.; Ginsberg, Guenter; Hodgins, Bruce J.; Richardson, John A.; Britton, Ted W.; Grimm, Richard M.; Bello, Ernesto; Rodriguez, Rodolfo R.; and Saltz, Ivan K., 4,276,260, Cl. 422-100.000.
Ginsberg, Guenter; and Horne, Thomas, 4,276,051, Cl. 23-230.00R.
Ginsberg, Guenter; and Hodgins, Bruce J., 4,276,258, Cl. 422-64.000.
Coulter Systems Corporation: *See—*
Kuehnle, Manfred R.; and Perry, George J., 4,275,957, Cl. 355-10.000.
Cowgill, Joseph R.: *See—*
Marvin, Ira E.; and Cowgill, Joseph R., 4,275,557 Cl. 60-39.030.
Cowley, Gerald, to ERCO Industries Limited. Chlorine dioxide generator. 4,276,262, Cl. 422-187.000.
Cox, Lyndon S.: *See—*
Gottron, Richard N.; and Cox, Lyndon S., 4,275,658, Cl. 102-210.000.
CPC International Inc.: *See—*
Heady, Robert E., 4,276,379, Cl. 435-94.000.
Sharma, Shri C., 4,276,316, Cl. 426-466.000.
Crankshaw, John H. Overrunning clutch. 4,275,805, Cl. 192-46.000.
Crawford, Fred I., to Hughes Aircraft Company. Infrared focal plane with automatic responsivity control using photodetector bias modulation. 4,276,474, Cl. 250-349.000.
Credle, William S., Jr., to Coca-Cola Company, The. Automatic change-over system for liquid dispensing system. 4,275,823, Cl. 222-94.000.
Cremer, Joseph; and Harnisch, Heink, to Hoechst Aktiengesellschaft. Active phosphorus nitrides containing hydroxyl and halogen, and process for making them. 4,276,343, Cl. 428-254.000.
Crepaux, Alain P.: *See—*
Bonzom, Albert; Crepaux, Alain P.; and Moutard, Anne-Marie E. J., 4,276,246, Cl. 264-53.000.
C ikelair, George F. Burn treatment. 4,276,281, Cl. 424-84.000.
Crime Fighter, Inc.: *See—*
Jarvis, Clifford W.; and Pearson, John E., 4,276,545, Cl. 340-545.000.
Critikon, Inc.: *See—*
Vaillancourt, Vincent L., 4,276,170, Cl. 210-436.000.
Crockett, Emmet E., to Otis Engineering Corporation. Line flow electric power generator. 4,276,482, Cl. 290-52.000.

Cromer, Charles F.; and Yoon, Kue H., to Westinghouse Electric Corp. Double-flow puffer-type compressed-gas circuit-interrupter. 4,276,456, Cl. 200-148.00A.

Crone, Jerry L., to Unarco Industries, Inc. Valve with body and stem of plastic material. 4,275,868, Cl. 251-310.000.

Crown Controls Corporation: *See*—
Dammeyer, Ned E., 4,276,622, Cl. 367-118.000.

Crown Zellerbach Corporation: *See*—
Stanley, Hugh E.; and Tokos, George M., 4,276,330, Cl. 428-35.000.

Crucible Inc.: *See*—
Haswell, Walter T.; Stasko, William; and Dax, F. Robert, 4,276,087, Cl. 75-243.000.

Csepel Muvek Hiradastechnikai Gepgyara: *See*—
Varga, Gabor; Szabo, Ferenc; Sztanyik, Ferenc; Vagvolgyi, Laszlo; and Nemeth, Jozsef, 4,275,594, Cl. 73-487.000.

Cummins Engine Company, Inc.: *See*—
Butler, Gordon K.; and Jefferson, Robert T., 4,275,889, Cl. 277-42.000.

Cyphers, Joseph A.: *See*—
Kothmann, Richard E.; and Cyphers, Joseph A., 4,276,355, Cl. 429-26.000.

Dahm, Franz-Ludwig; Diehl, Herbert; Eiermann, Kurt; Lamberty, Reinhold; and Nischk, Wolfgang, to Deutsche Gold und Silber Scheideanstalt vormals Roessler. Apparatus for continuously measuring ion concentrations. 4,276,143, Cl. 204-195.00M.

Daikin Kogyo Co., Ltd.: *See*—
Masuda, Kenji, 4,275,758, Cl. 137-489.000.
Yoshimura, Tatsushiro; and Tominaga, Shigetake, 4,276,214, Cl. 260-45.75K.

Daimler-Benz Aktiengesellschaft: *See*—
Forster, Hans-Joachim, 4,275,660, Cl. 104-247.000.
Worner, Gumer; and Schrape, Peter, 4,275,613, Cl. 74-475.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Hashimoto, Takeji; Okumoto, Kiyofumi; and Andoh, Masayasu, 4,275,573, Cl. 66-75.200.

Dainow, J. David: *See*—
Chodorow, Ingram S.; and Dainow, J. David, 4,275,736, Cl. 128-335.000.

Daito, Michimasa; and Sugino, Tohru, to Nissin Machine Works, Ltd. Centerless grinding machine. 4,275,527, Cl. 51-103.0TF.

Dakin, Thomas W.: *See*—
Mandelcorn, Lyon; Dakin, Thomas W.; and Miller, Robert L., 4,276,184, Cl. 252-579.000.

Dakss, Mark L.: *See*—
Carlsen, W. John; Dakss, Mark L.; and Lambert, Gary M., 4,276,113, Cl. 156-502.000.

Dale, John G.: *See*—
Denton, John B.; Dale, John G.; and Rimmer, Norman L., 4,275,816, Cl. 211-68.000.

Dallet, Francis A., to Societe Nationale des Poudres et Explosifs. Spirally wound pyrotechnic charge useful for the propulsion of an engine and the like. 4,275,657, Cl. 102-531.000.

Dalton, Charles A.; and Slinkard, William E., to Celanese Corporation. Attrition resistant catalysts. 4,276,196, Cl. 252-435.000.

Dalton, Christopher J.; and Roe, Graham D., to British Broadcasting Corporation. Method and apparatus for standards conversion of television signals. 4,276,565, Cl. 358-140.000.

Daman, Ernest L., to Foster Wheeler Energy Corporation. Coal feed system for a fluidized bed combustor. 4,275,668, Cl. 110-245.000.

Dammeyer, Ned E., to Crown Controls Corporation. Ultrasonic distance measuring circuit. 4,276,622, Cl. 367-118.000.

Danfoss A/S: *See*—
Zangenberg, Jan; and Clausen, Peter J. M., 4,275,996, Cl. 417-221.000.

Daniel, Keith P., to Ausonics Pty. Limited. Focusing piezoelectric ultrasonic medical diagnostic system. 4,276,491, Cl. 310-317.000.

Darrow, Russell E.: *See*—
Bakos, Peter; Bendz, Gerald A.; Darrow, Russell E.; and Rivenburgh, Dennis L., 4,276,186, Cl. 252-158.000.

Dart Industries Inc.: *See*—
Morrison, Howard J.; and Montague, Douglas P., 4,275,970, Cl. 401-6.000.
Schriever, Theodore W., 4,275,666, Cl. 108-101.000.

da Silva, Herman: *See*—
Aarsen, Jan A.; and da Silva, Herman, 4,276,653, Cl. 455-56.000.

Datapoint Corporation: *See*—
Halpern, Peter H.; and Lawrence, Charles E., 4,276,573, Cl. 360-45.000.

Davey Compressor Co.: *See*—
Robbins, Melvin E., 4,276,018, Cl. 431-352.000.

Davidheiser, Roger A., to TRW Inc. Quadriphase integrated high-speed microwave modulator. 4,276,521, Cl. 332-23.00R.

Davis, Merwyn C. Nonresetable thermally actuated switch. 4,276,531, Cl. 337-407.000.

Davis, Paul, to Sweetheart Plastics, Inc. Lid. 4,275,815, Cl. 206-508.000.

Davy Inc.: *See*—
Lutz, Irvin H., 4,276,120, Cl. 202-100.000.

Davy-Loewy Limited: *See*—
Hayes, Allan, 4,275,580, Cl. 72-239.000.

Davydenko, Nikolai M.: *See*—
Zaets, Inna I.; Davydenko, Nikolai M.; Yakshina, Olga K.; Pershina, Nina F.; Demyanenko, Valentina D.; and Pavlov, Jury M., 4,276,088, Cl. 106-1.120.

Dax, F. Robert: *See*—
Haswell, Walter T.; Stasko, William; and Dax, F. Robert, 4,276,087, Cl. 75-243.000.

Dayco Corporation: *See*—
Johnson, Joseph S.; and Stiles, Carl A., 4,275,829, Cl. 232-17.000.

De La Rue Systems Limited: *See*—
Hilton, Graham H., 4,275,667, Cl. 109-44.000.

Deal, Carl P., Jr. Fruit harvester. 4,275,549, Cl. 56-328.00R.

DeCoene, Frans J. G. C., to Sperry Corporation. Haymaking machine. 4,275,552, Cl. 56-370.000.

Deere & Company: *See*—
Jensen, Thomas C.; and Lowe, Terry L., 4,275,792, Cl. 172-703.000.
Ryan, Edward C.; and Parker, Jimmy J., 4,276,037, Cl. 474-70.000.

De Franco, Samuel M., to Willamette Industries, Inc. Dispensing box construction. 4,275,828, Cl. 229-23.00R.

Degen, Hans-Jurgen; and Grychtol, Klaus. Basic dyes. 4,276,415, Cl. 542-435.000.

Degremont: *See*—
Cordier, Michel; Labaquere, Herve; and Saint-Dizier, Gilbert, 4,276,181, Cl. 210-741.000.

de Groot, Fredrik W.; and Bernert, Jorg D., to Lisega Kraftwerkstechnik GmbH & Co. KG. Mechanical shock absorber. 4,275,802, Cl. 188-134.000.

Degussa AG: *See*—
Hecke, Emil, 4,276,274, Cl. 423-336.000.

Deichert, William G.: *See*—
Chromecek, Richard C.; Deichert, William G.; Falcetta, Joseph J.; and VanBuren, Martin F., 4,276,402, Cl. 526-264.000.

de Jager, Frank; van Doorn, Rudolf A.; Verboom, Johannes V.; and Carasso, Marino G., to U.S. Philips Corporation. Method of synchronizing a quadphase receiver and clock synchronization device for carrying out the method. 4,276,650, Cl. 375-110.000.

Delachaux, C.: *See*—
Bommart, Patrick, 4,275,499, Cl. 30-180.000.

De Laever, Jacques: *See*—
de Lockerente, Serge R.; and De Laever, Jacques, 4,276,269, Cl. 423-101.000.

DeLaney, Gene. Positive safety brake for oil well pumping apparatus. 4,275,609, Cl. 74-41.000.

de Leiris, Jean-Pierre, to La Cellophane. Cellulose packaging films for packaging soft cheeses. 4,276,340, Cl. 428-166.000.

Della Bella, Davide; and Chiarino, Dario, to Zambon S.p.A. 1-(3-Bromo-Isoxazol-5-y)-2-tert.butylaminoethanol. 4,276,299, Cl. 424-272.000.

Della Croce, John B. Intra oral tracing apparatus. 4,276,022, Cl. 433-71.000.

Delmas, Jean R., to Microlec S.A. Apparatus for checking dimensional tolerances. 4,275,505, Cl. 33-172.00E.

de Lockerente, Serge R.; and De Laever, Jacques, to Hollux S.A. Process of hydrometallurgical treatment for eliminating impurities from a solution containing dissolved metals. 4,276,269, Cl. 423-101.000.

Dema Engineering Co.: *See*—
Holmes, Lambert, 4,276,001, Cl. 417-401.000.

Demyanenko, Valentina D.: *See*—
Zaets, Inna I.; Davydenko, Nikolai M.; Yakshina, Olga K.; Pershina, Nina F.; Demyanenko, Valentina D.; and Pavlov, Jury M., 4,276,088, Cl. 106-1.120.

Denki Onkyo Company, Limited: *See*—
Masuda, Noboru; and Sugimoto, Masakazu, 4,276,499, Cl. 318-119.000.

Dennetiere, Andre, to Duvant, S.A. Internal combustion engine of the type having two inlet valves per cylinder. 4,275,698, Cl. 123-527.000.

Dennison Manufacturing Company: *See*—
Russell, David B., 4,276,255, Cl. 264-288.800.

Denton, John B.; Dale, John G.; and Rimmer, Norman L. Compact wall mounted cue rack. 4,275,816, Cl. 211-68.000.

Derossi, Piero M. Device for the leveling of the gyroscopic axis of a compass with a mechanical suspension and an antipendular-torque precession system. 4,275,604, Cl. 74-5.120.

Desa Industries, Inc.: *See*—
Kotas, John A., 4,275,778, Cl. 144-193.00A.

deSilva, Dodwell P.: *See*—
Vasishth, Ramesh C.; and deSilva, Dodwell P., 4,276,329, Cl. 427-393.000.

De Thomas, Waldo R.: *See*—
Hort, Eugene V.; and De Thomas, Waldo R., 4,276,215, Cl. 260-326.5FN.

Deutsche Gold und Silber Scheideanstalt vormals Roessler: *See*—
Dahm, Franz-Ludwig; Diehl, Herbert; Eiermann, Kurt; Lamberty, Reinhold; and Nischk, Wolfgang, 4,276,143, Cl. 204-195.00M.

Deverrewaere, Alain, to Cibie Projecteurs. Rectangular-opening sealed beam units for automobile lighting. 4,276,585, Cl. 362-308.000.

De Vries, Jochem J.: *See*—
Engelhardt, Manfred; Reinink, Jan; De Vries, Jochem J.; Trees, Ferdinand M.; Tietjens, Eduard W.; and Groothuis, Gerrit J., 4,275,497, Cl. 30-43.600.

DeWitte, Gordon J., to General Electric Company. Tester and method for checking meter encoders in automatic meter reading systems. 4,276,644, Cl. 371-25.000.

DeYoung, Simon A. Braiding machine. 4,275,638, Cl. 87-48.000.

Diamond International Corporation: *See*—
Harvey, Albert J., 4,275,856, Cl. 242-75.440.

Diamond Shamrock Corporation: *See*—
Johnson, Grannis S.; and Rose, Ira M., 4,275,906, Cl. 282-27.500.

DiBlasio, John A., to Brandt-Pra, Inc. Extended stacker. 4,275,874, Cl. 271-4.000.

Diehl, Herbert: *See—*
Dahm, Franz-Ludwig; Diehl, Herbert; Eiermann, Kurt; Lamberty, Reinhold; and Nischk, Wolfgang, 4,276,143, Cl. 204-195.00M.

Dienes Werke fuer Maschinenteile GmbH & Co. KG: *See—*
Wingen, Peter, 4,275,631, Cl. 83-501.000.

Dieterich, Dieter, to Bayer Aktiengesellschaft. Water-soluble, ultra-filtrable polyurethane anionomers and the use thereof as sizes in the textile industry. 4,276,044, Cl. 8-115.500.

Dieterich, Dieter: *See—*
Scholl, Hans-Joachim; Dieterich, Dieter; and Markusch, Peter, 4,276,404, Cl. 528-57.000.

Dieudonne, Marc P. G.: *See—*
Nguyen, Hieu K.; Dieudonne, Marc P. G.; and Lager, Jean-Paul, 4,276,641, Cl. 370-99.000.

DiGiacomo, Peter M.; and Dines, Martin B., to Occidental Research Corporation. Layered cyano end terminated organophosphorus inorganic polymers. 4,276,409, Cl. 528-362.000.

DiGiacomo, Peter M.; and Dines, Martin B., to Occidental Research Corporation. Layered organophosphorus inorganic polymers containing mercapto or thio groups. 4,276,410, Cl. 528-373.000.

DiGiacomo, Peter M.; and Dines, Martin B., to Occidental Research Corporation. Layered organophosphorus inorganic polymers containing acyclic groups. 4,276,411, Cl. 528-395.000.

di Marco, Aurelio: *See—*
Cassinelli, Giuseppe; Ruggieri, Daniela; Arcamone, Federico; and di Marco, Aurelio, 4,276,289, Cl. 424-180.000.

Dimitroff, Michael V.: *See—*
Parkinson, Martin; and Dimitroff, Michael V., 4,275,511, Cl. 34-92.000.

Dines, Martin B.: *See—*
DiGiacomo, Peter M.; and Dines, Martin B., 4,276,409, Cl. 528-362.000.
DiGiacomo, Peter M.; and Dines, Martin B., 4,276,410, Cl. 528-373.000.
DiGiacomo, Peter M.; and Dines, Martin B., 4,276,411, Cl. 528-395.000.

Dinsmore, Harold L., to John Zink Company. Process and apparatus for recovering hydrocarbons from air-hydrocarbon vapor mixtures. 4,276,058, Cl. 55-48.000.

Dirkes, William R.: *See—*
Bench, Stephen M.; Dirkes, William R.; Juglekar, Manohar A.; Secora, James C.; and Stephen, Michael A., 4,276,651, Cl. 375-120.000.

Dissly, Donald D.; and Blanchard, Ronald J., to Volt Delta Resources, Inc. Method and apparatus for information storage and retrieval. 4,276,597, Cl. 364-300.000.

Dittrick, John W.: *See—*
Willis, Brian J.; and Dittrick, John W., 4,276,220, Cl. 260-345.100.

Dixon, Edgar A.: *See—*
Morgan, Stanley A.; and Dixon, Edgar A., 4,276,636, Cl. 369-291.000.

Dixon, Rolland E.; and Chapman, Charles C., to Phillips Petroleum Company. Catalytic alkylation of hydrocarbons. 4,276,257, Cl. 422-62.000.

Dobashi, Toshio, to Nippon Kogaku K.K. Automatic focusing apparatus for camera. 4,275,954, Cl. 354-198.000.

Dr. Eduard Fresenius, Chemisch-pharmazeutische Industrie KG Apparatebau KG: *See—*
Schael, Wilfried, 4,275,726, Cl. 128-213.00A.

Dr.-Ing Rudolf Hell GmbH: *See—*
Wellendorf, Klaus; and Sing, Gerhard, 4,276,567, Cl. 358-280.000.
Wischer, Hermann, 4,276,568, Cl. 358-282.000.

Dodds, Philip J.: *See—*
Watson, John B.; and Dodds, Philip J., 4,276,564, Cl. 358-139.000.

Doelter, Gandolph, to New Zipper Company Limited, The. Sliding clasp fasteners and garments, articles and sheeting having such fasteners. 4,275,467, Cl. 2-82.000.

Dolak, Lester A.; Laborde, Alice L.; and Castle, Thomas M., to Upjohn Company, The. 3-Trehalosamine compounds. 4,276,412, Cl. 536-17.00R.

DOM-Sicherheitstechnik GmbH & Co. KG: *See—*
Wolter, Heinz, 4,276,453, Cl. 200-44.000.

Domtar Inc.: *See—*
Karnis, Alkibiadis; and Shallhorn, Paul M., 4,276,119, Cl. 162-49.000.

Donitz, Wolfgang: *See—*
Schmidberger, Rainer; and Donitz, Wolfgang, 4,276,202, Cl. 252-462.000.

Donnert, Dietfried; Eberle, Siegfried; and Endres, Gerhard, to Kernforschungszentrum Karlsruhe GmbH. Method for waste water purification with the aid of a sorption agent. 4,276,160, Cl. 210-660.000.

Dornier System GmbH: *See—*
Schmidberger, Rainer; and Donitz, Wolfgang, 4,276,202, Cl. 252-462.000.

Doron Precision Systems, Inc.: *See—*
Radice, John G., 4,276,030, Cl. 434-62.000.

Dorr, Karl H.: *See—*
Blumrich, Walter; Dorr, Karl H.; Konig, Hans J.; and Sander, Ulrich, 4,276,116, Cl. 159-47.00R.

Dorr-Oliver Incorporated: *See—*
Browne, Paul A.; and Morton, Robert W., 4,276,169, Cl. 210-404.000.

Douda, Bernard E.: *See—*
Colvin, Robert E.; Douda, Bernard E.; Montgomery, Francis E.; and Short, James E., Jr., 4,276,100, Cl. 149-109.600.

Doura, Fumihiro: *See—*
Nakabayashi, Masamitsu; Doura, Fumihiro; and Hori, Teruo, 4,276,390, Cl. 525-61.000.

Dow Chemical Company, The: *See—*
Hefner, Robert E., Jr., 4,276,156, Cl. 209-166.000.
Monnerat, Georgia A.; Ham, George E.; Hairston, Thomas J.; and Hatch, Melvin J., 4,276,406, Cl. 528-92.000.
Nestrick, Terry J.; and Stehl, Rudolph H., 4,276,061, Cl. 55-67.000.
Porta, Augusto; and Mosetti, Jacques, 4,276,134, Cl. 204-153.000.

Dragerwerk Aktiengesellschaft: *See—*
Warncke, Ernst; and Pasternack, Adalbert, 4,275,723, Cl. 128-202.220.

Draper, Leonard C. Utility cabinet for dentists. 4,275,940, Cl. 312-209.000.

Dravo Corporation: *See—*
Karnofsky, George B.; and Brink, Robert E., 4,276,021, Cl. 432-85.000.

Drbal, Vladimir J.; Ginsberg, Guenter; Hodgins, Bruce J.; Richardson, John A.; Britton, Ted W.; Grimm, Richard M.; Bello, Ernesto; Rodriguez, Rodolfo R.; and Saltz, Ivan K., to Coulter Electronics, Inc. Fluid transfer mechanism. 4,276,260, Cl. 422-100.000.

Dresser Industries, Inc.: *See—*
Purton, Robert M.; and Hanson, Lloyd D., 4,275,842, Cl. 239-446.000.

Dreyer, Heinz, to Amazonen-Werke. Seed drill mounting arrangement. 4,275,670, Cl. 111-85.000.

Drnevich, Raymond F.: *See—*
Breider, Edmund J.; and Drnevich, Raymond F., 4,276,174, Cl. 210-613.000.

Dron, Sylvain M.; and Evrard, Gerard M. G., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Multiple coil electromagnetic pickup. 4,276,489, Cl. 310-155.000.

Dubberly, Gregory T.; and McGowan, Robert J., to Mead Corporation, The. Apparatus for receiving empty beverage containers. 4,276,467, Cl. 235-92.0PK.

Ducellier & Cie: *See—*
Gruson, Michel, 4,276,577, Cl. 361-91.000.

Dudek, Thomas J.: *See—*
Aggarwal, Sundar L.; Marker, Leon F.; Dudek, Thomas J.; and Herold, Robert J., 4,276,009, Cl. 425-130.000.

Dugas, Roger A., to Hewlett-Packard Company. Direction control flush valve. 4,275,765, Cl. 137-625.480.

Dugger, Doyle L.; and Ho, Morris D., to Bandag Incorporated. Method and apparatus for non-destructive inspection of tires. 4,275,589, Cl. 73-146.000.

Dumbeck, Robert F. Solar energy collector system. 4,275,711, Cl. 126-425 000.

Dumortier, Philippe: *See—*
Remillieux, Jean; Rebours, Albert; Dumortier, Philippe; and Marchal, Paul H. L., 4,276,019, Cl. 432-1.000.

Duncon, William J.: *See—*
Beales, Keith J.; Duncon, William J.; Dunn, Anthony G.; and Newns, George R., 4,275,951, Cl. 350-96.310.

Dunlop Limited: *See—*
Kenyon, Dennis, 4,275,832, Cl. 238-310.000.

Dunn, Anthony G.: *See—*
Beales, Keith J.; Duncon, William J.; Dunn, Anthony G.; and Newns, George R., 4,275,951, Cl. 350-96.310.

Dunne, Maurice J.: *See—*
Engelberger, Joseph F.; Lindbom, Torsten H.; Dunne, Maurice J.; Perzley, William; Roberts, Wilbur N.; and Gardner, Horace L., 4,275,986, Cl. 414-730.000.

Dunweg, Gustav: *See—*
Henne, Werner; and Dunweg, Gustav, 4,276,172, Cl. 210-490.000.

Du Pont de Nemours, E. I., and Company: *See—*
Clement, Robert A.; and Anderson, Burton C., 4,276,226, Cl. 260-410.500.
Khanna, Ram-Tirth; and Turner, Robert L., 4,276,212, Cl. 260-39.00R.
McCartin, Peter J.; and Nebe, William J., 4,276,366, Cl. 430-291.000.
Phillips, Thomas R., 4,276,351, Cl. 428-437.000.

Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., to Smith Kline & French Laboratories Limited. Imidazole alkylthiourea compounds. 4,276,301, Cl. 424-273.00R.

Duvant, S.A.: *See—*
Dennetiere, Andre, 4,275,698, Cl. 123-527.000.

Dyckerhoff & Widmann AG: *See—*
Finsterwalder, Ulrich, 4,275,679, Cl. 114-264.000.

Dynatech AG: *See—*
Leaback, David H., 4,276,048, Cl. 23-230.00R.

Dyneer Corporation: *See—*
Kraft, Derald H., 4,276,038, Cl. 474-110.000.

E. Beaudrey & Cie: *See—*
Jackson, Philip, 4,276,171, Cl. 210-437.000.

E M I Limited: *See—*
Green, Ian M., 4,276,618, Cl. 367-11.000.

E-Systems, Inc.: *See—*
Loposer, Thomas L., 4,276,550, Cl. 343-100.0CL.

Earl, Roscoe T.: *See—*
Norton, William W.; Stansbeary, Jack L.; Clemens, Johann; and Earl, Roscoe T., 4,275,480, Cl. 17-25.000.

Eastman, James M.: *See—*
Perkey, Russell C.; Thoman, David C.; and Eastman, James M., 4,276,006, Cl. 418-94.000.

Eastman Kodak Company: *See—*
Bissell, Reeder E., 4,276,400, Cl. 526-152.000.
Goodhue, Charles T.; Esders, Theodore W.; and Masurekar, Prakash S., 4,276,377, Cl. 435-18.000.
Gwynn, Donald E., 4,276,396, Cl. 525-338.000.
Leone, Ronald E., 4,276,364, Cl. 430-212.000.

Eaton Corporation: *See—*
Jones, William H., 4,275,508, Cl. 34-43.000.
Kalns, Ilmars, 4,275,617, Cl. 74-750.00R.
Piber, Earl T., 4,276,461, Cl. 200-329.000.
Silvester, Robert C., 4,275,612, Cl. 74-473.00R.

Eberle, Siegfried: *See—*
Donnert, Dietfried; Eberle, Siegfried; and Endres, Gerhard, 4,276,160, Cl. 210-660.000.

Eckert, Joachim: *See—*
Geisler, Diether; and Eckert, Joachim, 4,275,525, Cl. 46-39.000.

Eckhardt, Wolfgang: *See—*
Kunz, Walter; Eckhardt, Wolfgang; and Hubele, Adolf, 4,276,303, Cl. 424-273.00R.

Eddy, William R.; and Taylor, Raymond C., to Phillips Petroleum Company. Ring grooving apparatus for use with a packaging machine or the like. 4,276,043, Cl. 493-160.000.

Edelman, Alfred E. Angulation head for dental implant and bending tool for same. 4,276,026, Cl. 433-176.000.

Edo Corporation: *See—*
Miko, Richard J.; and Shapiro, Daniel H., 4,276,065, Cl. 55-278.000.

Edo Western Corporation: *See—*
Jones, Howard P., 4,275,959, Cl. 355-20.000.

Edrich, Jochen. Procedure for noncontacting measurement of subcutaneous temperature distributions. 4,275,741, Cl. 128-653.000.

Edwards, Jesse O. Roller skate brake. 4,275,895, Cl. 280-11.200.

Effem GmbH: *See—*
Kramer, Walter; and Follmann, Rainer, 4,275,684, Cl. 119-1.000.

Egami, Tsuneyuki: *See—*
Kawai, Hisasi; Egami, Tsuneyuki; Kohama, Tokio; and Obayashi, Hideki, 4,275,590, Cl. 73-204.000.

Egger, Hansruedi, to Intradym Maschinen AG. Method and apparatus for spraying concrete. 4,275,836, Cl. 239-124.000.

Egli, Alwin, to SIG Schweizerische Industrie-Gesellschaft. System for the accurate dosing of bulk material. 4,275,775, Cl. 141-83.000.

Eguchi, Yukuo: *See—*
Ishikawa, Masayuki; Tanaka, Hiromichi; Eguchi, Yukuo; Ito, Shigeru; Takashima, Yoshimi; and Kobayashi, Masahiko, 4,276,295, Cl. 424-251.000.

Ehrlinger, Friedrich; Mann, Egon; Fischer, Manfred; and Jocham, Rudolf, to Zahnradfabrik Friedrichshafen AG. Hydraulic wheel drive. 4,275,616, Cl. 74-730.000.

Eibl, Johann; and Aicher, Helmut, to Immuno Aktiengesellschaft fur chemisch-medizinische Produkte. Apparatus for performing a radioimmunological method of determining antigens or antibodies. 4,276,259, Cl. 422-71.000.

Eibl, Martha; Schwarz, Otto; and Linnau, Yendra, to Immuno Aktiengesellschaft fur chemisch-medizinische Produkte. Method of preparing an intravenously administrable immune globulin preparation containing antibodies and preparations produced according to this method. 4,276,283, Cl. 424-85.000.

Eicher, Josef. Safety mechanism for a carriage insertable into the load space of a vehicle. 4,275,896, Cl. 280-43.100.

Eiermann, Kurt: *See—*
Dahm, Franz-Ludwig; Diehl, Herbert; Eiermann, Kurt; Lamberty, Reinhold; and Nischk, Wolfgang, 4,276,143, Cl. 204-195.00M.

Eizumi, Hideo: *See—*
Ohara, Isamu; Muranaka, Tsutomu; and Eizumi, Hideo, 4,276,528, Cl. 335-75.000.

Elast-O-Cor Products & Engineering Limited: *See—*
Macierewicz, Jacek J., 4,276,059, Cl. 55-52.000.

Electric Power Research Institute, Inc.: *See—*
Benke, Frank W.; and Moore, Curtis L., 4,276,530, Cl. 336-58.000.
Kimblin, Clive W.; and Slade, Paul G., 4,276,455, Cl. 200-144.00B.
Pasic, Hajrudin; and Herrmann, George, 4,276,056, Cl. 55-13.000.

Eli Lilly and Company: *See—*
Bach, Nicholas J.; and Kornfeld, Edmund C., 4,276,300, Cl. 424-273.00P.

Elkins, Christopher W.; and Smith, David W., to Teledyne Industries, Inc. Fluid coupling assembly. 4,275,908, Cl. 285-55.000.

Ellertson, Melvin E.: *See—*
Chambers, Lee; and Ellertson, Melvin E., 4,275,647, Cl. 99-339.000.

Elliott, Harry S., to Varco, Inc. Solid state controller. 4,276,502, Cl. 318-565.000.

Ellis, Howard F.: *See—*
Levinson, Lionel M.; Ellis, Howard F.; and Fishman, Herbert, 4,276,578, Cl. 361-127.000.

Embree, Milton L.; Goldthorp, David C.; and Vogelpohl, David R., to Bell Telephone Laboratories, Incorporated. Electronic tone ringer. 4,276,448, Cl. 179-84.00T.

Emery, William G., to Koppers Company, Inc. Coke oven battery bench cleaning apparatus. 4,276,123, Cl. 202-241.0G0.

Emhart Industries, Inc.: *See—*
Fenton, Frank A., 4,276,076, Cl. 65-241.000.

Endres, Gerhard: *See—*
Donnert, Dietfried; Eberle, Siegfried; and Endres, Gerhard, 4,276,160, Cl. 210-660.000.

Energy Research Corporation: *See—*
Baker, Bernard S., 4,276,356, Cl. 429-41.000.

Enge, Harald A., to Varian Associates, Inc. Focusing apparatus for uniform application of charged particle beam. 4,276,477, Cl. 250-398.000.

Engelberger, Joseph F.; Lindbom, Torsten H.; Dunne, Maurice J.; Perzley, William; Roberts, Wilbur N.; and Gardner, Horace L., to Unimation, Inc. Programmable automatic assembly system. 4,275,986, Cl. 414-730.000.

Engelhardt, Manfred; Reinink, Jan; De Vries, Jochem J.; Trees, Ferdinand M.; Tietjens, Eduard W.; and Groothuis, Gerrit J., to U.S. Philips Corporation. Shaving apparatus. 4,275,497, Cl. 30-43.600.

Engelsberger, Georg: *See—*
Lindner, Tassilo; Zeller, Norbert; Frey, Volker; Riedle, Rudolf; John, Peter; and Engelsberger, Georg, 4,276,426, Cl. 556-479.000.

Engl, Gunter, to Kraftwerk Union Aktiengesellschaft. Ultrasonic testing device. 4,275,598, Cl. 73-622.000.

Ennis, James F.: *See—*
Silver, Jules; and Ennis, James F., 4,275,729, Cl. 128-218.00C.

Enomoto, Hiromu; Yasuda, Yasushi; Ohmichi, Hitoshi; and Mitono, Yoshiharu, to Fujitsu Limited. Semiconductor device. 4,276,556, Cl. 357-52.000.

Enomoto, Kazuo: *See—*
Ogasawara, Tsutomu; and Enomoto, Kazuo, 4,275,941, Cl. 312-223.000.

Envirosol Systems International, Ltd.: *See—*
Vasishth, Ramesh C.; and deSilva, Dodwell P., 4,276,329, Cl. 427-393.000.

Epner, Randolph L.; and Sam, Ahmad. Apparatus for recovery of metals from solution. 4,276,147, Cl. 204-272.000.

Erbach, Emil-Richard; Klunsch, Max; Lindner, Gerhard; and Lingens, Paul. Method for the continuous production of explosive mixtures. 4,275,967, Cl. 366-149.000.

Erck, Edwin E. Recliner. 4,275,472, Cl. 5-60.000.

ERCO Industries Limited: *See—*
Cowley, Gerald, 4,276,262, Cl. 422-187.000.
McGilvery, James D., 4,276,273, Cl. 423-305.000.

Errut Products Limited: *See—*
Jackson, Philip, 4,275,928, Cl. 299-39.000.

Esaki, Shingo: *See—*
Mibu, Hiroaki; Ishihara, Tadashi; Tanaka, Chiaki; and Esaki, Shingo, 4,276,479, Cl. 250-492.00R.

Esders, Theodore W.: *See—*
Goodhue, Charles T.; Esders, Theodore W.; and Masurekar, Prakash S., 4,276,377, Cl. 435-18.000.

Eshraghian, Kamran; and Bogner, Robert E., to U.S. Philips Corporation. Vehicle detection systems. 4,276,539, Cl. 340-38.00L.

Essex Cryogenics of Missouri, Inc.: *See—*
Lyons, Jerry L.; and Mertz, Denny W., 4,275,754, Cl. 137-75.000.

Estrada, John A.: *See—*
Kohlenberger, Charles W.; Kirkpatrick, Craig G.; Estrada, John A.; and Chang, George Q., 4,275,599, Cl. 73-774.000.

Etablissement Caillau: *See—*
Irio, Francis; and Chene, Richard, 4,275,484, Cl. 24-20.00R.

Ethyl Corporation: *See—*
Jackisch, Philip F., 4,276,189, Cl. 252-404.000.
Patton, John S., 4,275,817, Cl. 215-217.000.

Ets Van Doren: *See—*
Van Doren, Bernard M., 4,275,636, Cl. 84-383.00R.

Etschenberg, Eugen; Opitz, Wolfgang; and Raddatz, Siegfried, to Troponwerke GmbH & Co., KG. Dehydrooligopeptides, their production and their medicinal use. 4,276,288, Cl. 424-177.000.

Eventoff, Franklin N.; and Tcherepnin, Serge A., to Eventoff, Franklin N. Touch switch keyboard apparatus. 4,276,538, Cl. 338-69.000.

Evrard, Gerard M. G.: *See—*
Dron, Sylvain M.; and Evrard, Gerard M. G., 4,276,489, Cl. 310-155.000.

Excelermatic Inc.: *See—*
Kraus, Charles E., 4,275,610, Cl. 74-200.000.

Expertise Assistance Inc.: *See—*
Ruff, Alonzo W., 4,275,645, Cl. 98-36.000.

Exxon Production Research Company: *See—*
Rickenbacker, James E., 4,276,619, Cl. 367-13.000.

Exxon Research & Engineering Co.: *See—*
Kirk, John H., Jr., 4,276,569, Cl. 358-298.000.
Sawyer, Willard H., 4,276,201, Cl. 252-455.00R.

Fabbrica Italiana Magneti Marelli S.p.A.: *See—*
Ferrarini, Franco, 4,276,357, Cl. 429-63.000.

Fabiano, Anthony: *See—*
Grimaldi, Anthony J.; and Fabiano, Anthony, 4,275,883, Cl. 273-26.00A.

Fabricius, John H.: *See—*
Beck, Martin A.; Fabricius, John H.; and Landis, Donald G., 4,276,603, Cl. 364-477.000.

Fabrique d'Horlogerie de Fontainemelon S.A.: *See—*
Paratte, Daniel, 4,276,630, Cl. 368-88.000.

Fahrig, Robert J., to Standard Oil Company (Indiana). Double-slide valve. 4,275,763, Cl. 137-613.000.

Fairbank, Brian H. Snow-making apparatus. 4,275,833, Cl. 239-2.00S.

Fairchild Camera & Instrument Corp.: *See—*
Arguello, Leonard E.; and Blaser, Lawrence M., 4,275,701, Cl. 123-609.000.
Hennig, Falke, 4,276,616, Cl. 365-177.000.

Faisandier, Yves, to C.M. Industries. Process and device for processing and displaying a read-out signal from an electrocardiogram recording

read at a speed greater than the speed of recording. 4,275,742, Cl. 128-703.000.
Falcetta, Joseph J.: *See—*
Chromecek, Richard C.; Deichert, William G.; Falcetta, Joseph J.; and VanBuren, Martin F., 4,276,402, Cl. 526-264.000.
Falk, Hans: *See—*
Pohler, Friedmar; Falk, Hans; Muller, Josef; Klein, Hans J.; and Hoffacker, Franz, 4,276,324, Cl. 427-10.000.
Falk, John C., to Borg-Warner Corporation. Char-forming additives for olefin polymers. 4,276,393, Cl. 525-233.000.
Fangmeyer, Dennis L., to Ransburg Corporation. Rotating atomizing device. 4,275,838, Cl. 239-223.000.
Fanz, Helmut, to Regie Nationale des Usines Renault. Device for cleaning and defogging, especially for the rear window of an automobile. 4,276,501, Cl. 318-470.000.
Farmhand, Inc.: *See—*
Lenertz, John B., 4,275,984, Cl. 414-686.000.
Farmitalia Carlo Erba, S.p.A.: *See—*
Cassinelli, Giuseppe; Ruggieri, Daniela; Arcamone, Federico; and di Marco, Aurelio, 4,276,289, Cl. 424-180.000.
Fehler, Adolf: *See—*
Kappler, Guenter; and Fehler, Adolf, 4,275,564, Cl. 60-738.000.
Fejer, Andrew A., to Institute of Gas Technology. Composite energy producing gas turbine. 4,275,562, Cl. 60-648.000.
Felber, Betty J.: *See—*
Lawrence, Dan D.; and Felber, Betty J., 4,275,789, Cl. 166-294.000.
Fenton, Frank A., to Emhart Industries, Inc. Transfer means of glassware forming machines. 4,276,076, Cl. 65-241.000.
Ferguson, Gerald D., to United States of America, Navy. Optical oscillator. 4,276,518, Cl. 331-94.50C.
Ferodo Limited: *See—*
Bartram, David T., 4,276,328, Cl. 427-381.000.
Ferrarini, Franco, to Fabbrica Italiana Magneti Marelli S.p.A. Device for self-leveling of electrolyte in electric accumulators. 4,276,357, Cl. 429-63.000.
Ferry, Merle W., to Procter & Gamble Company, The. Detergent compositions containing amine oxide and nonionic surfactants and polyethylene glycol. 4,276,205, Cl. 252-528.000.
Fettel, Bruce E.; Morris, Paul E.; and Lichte, Leo J., to Shiley Incorporated. Electro-chemically machined ring and strut structure for prosthetic heart valves. 4,276,132, Cl. 204-129.100.
Feuerman, Arnold I. Vaporized fuel for internal combustion engine. 4,276,131, Cl. 204-129.000.
Feugier, Alain: *See—*
Brun, Didier; Chrysostome, Gerard; Feugier, Alain; and Sale, Bernard, 4,276,266, Cl. 423-1.000.
Fewell, Larry L.: *See—*
United States of America, National Aeronautics and Space Administration; Allcock, Harry R.; O'Brien, John P.; Scopelianos, Angelo G.; and Fewell, Larry L., 4,276,403, Cl. 528-4.000.
Fiat Trattori S.p.A.: *See—*
Brancolini, Emiliano, 4,275,608, Cl. 74-15.630.
Fibergrate Corporation: *See—*
Coonrod, William C., 4,276,337, Cl. 428-134.000.
Field, Sydney J., to Actionair Equipment Limited. Control damper. 4,275,762, Cl. 137-601.000.
Finnemore, Fred M.: *See—*
Lanno, Joseph P.; and Finnemore, Fred M., 4,275,821, Cl. 222-61.000.
Finsterwalder, Ulrich, to Dyckerhoff & Widmann AG. Floating platform with monolithically formed float members and platform. 4,275,679, Cl. 114-264.000.
Firca, Joseph R.; and Rudbach, Jon A., to Abbott Laboratories. Method for systemic endotoxin detection. 4,276,050, Cl. 23-230.00B.
Firestone Tire & Rubber Company, The: *See—*
Yang, James H. C., 4,276,012, Cl. 425-435.000.
Fischell, Robert E., to Johns Hopkins University, The. Charge control switch responsive to cell casing deflection. 4,275,739, Cl. 128-419.0PS.
Fischer, Kurt: *See—*
Petersen, Harro; Krause, Hans-Joachim; Fischer, Kurt; Segnitz, Adolph; and Zaunbrecher, Horst, 4,276,209, Cl. 260-28.00P.
Fischer, Manfred: *See—*
Ehrlinger, Friedrich; Mann, Egon; Fischer, Manfred; and Jocham, Rudolf, 4,275,616, Cl. 74-730.000.
Fisco, Marshall. Apparatus for moving merchandise gondolas. 4,275,982, Cl. 414-459.000.
Fisher, Charles B.; and Fisher, Sidney T. Acoustic transmission system. 4,276,624, Cl. 367-134.000.
Fisher, Sidney T.: *See—*
Fisher, Charles B.; and Fisher, Sidney T., 4,276,624, Cl. 367-134.000.
Fishman, Herbert: *See—*
Levinson, Lionel M.; Ellis, Howard F.; and Fishman, Herbert, 4,276,578, Cl. 361-127.000.
Flaig, Hans: *See—*
Assmus, Friedrich; Flaig, Hans; Wolber, Robert; and Maurer, Roland, 4,276,634, Cl. 368-300.000.
Flavio, Rinaldi, to Superforni Rinaldi S.p.A. Electric oven for the continuous baking of pizzas. 4,276,465, Cl. 219-388.000.
Fleck, William C., to Intraspec Inc. Programmable sequencer apparatus. 4,276,610, Cl. 364-900.000.
Fleek, Arthur E.: *See—*
Bolcavage, Richard D.; Fleek, Arthur E.; and Marcus, Mitchell P., 4,275,653, Cl. 101-93.140.
Flo-Con Systems, Inc.: *See—*
King, Patrick D.; and Folk, Gary R., 4,275,825, Cl. 222-590.000.
Flymo Societe Anonyme: *See—*
Lindman, Karl A., 4,276,067, Cl. 55-337.000.
Flynn, Richard T.; and Kindell, Jerry L., to Honeywell Information Systems Inc. Short operand alignment and merge operation. 4,276,596, Cl. 364-200.000.
FMC Corporation: *See—*
Garber, Arnold L., 4,275,639, Cl. 89-41.00E.
Moirano, Arthur L., 4,276,320, Cl. 426-575.000.
Fodor, Lawrence M.: *See—*
Selman, Charles M.; and Fodor, Lawrence M., 4,276,192, Cl. 252-429.00B.
Foerster, Hubert; Horstmann, Winfried; and Sochor, Josef, to Robert Bosch GmbH. System for generating an error signal indicative of differences between recording and playback speeds. 4,276,559, Cl. 358-8.000.
Fohlen, George M.: *See—*
Varma, Indra K.; Fohlen, George M.; Parker, John A.; and Frosch, Robert A., 4,276,344, Cl. 428-260.000.
Folk, Gary R.: *See—*
King, Patrick D.; and Folk, Gary R., 4,275,825, Cl. 222-590.000.
Foller, Werner; and Symanczyk, Hermann, to Gestra-KSB Vertriebsgesellschaft mbH & Co. KG. Steam trap. 4,275,755, Cl. 137-195.000.
Follmann, Rainer: *See—*
Kramer, Walter; and Follmann, Rainer, 4,275,684, Cl. 119-1.000.
Fontana, Emanuel J. Halftone photographic method and apparatus. 4,275,961, Cl. 355-71.000.
Ford Aerospace & Communications Corp.: *See—*
Ho, Pang T.; and Rubin, Michael D., 4,276,558, Cl. 357-74.000.
Ford Motor Company: *See—*
Bishop, Gerald B., 4,276,240, Cl. 261-52.000.
Chattha, Mohinder S., 4,276,392, Cl. 525-118.000.
Ford, Willie. Dual wheel valve stem tool. 4,275,622, Cl. 81-125.100.
Forney, Melvin L., to Caterpillar Tractor Co. Fume extracting device for a welding apparatus. 4,276,464, Cl. 219-136.000.
Forry, Mark E.: *See—*
Ludwa, Raymond J.; Forry, Mark E.; and Haugen, Marilyn M., 4,276,338, Cl. 428-137.000.
Forster, Hans-Joachim, to Daimler-Benz Aktiengesellschaft. Automatically cross-guided vehicle, especially for the public local passenger traffic. 4,275,660, Cl. 104-247.000.
Foster Wheeler Energy Corporation: *See—*
Deman, Ernest L., 4,275,668, Cl. 110-245.000.
Fox, Edward V., Jr: *See—*
Snitzer, Elias; Anschutz, Donald E.; and Fox, Edward V., Jr, 4,275,965, Cl. 356-375.000.
France, Haywood G.: *See—*
Koleske, Joseph V.; Smith, Oliver W.; France, Haywood G.; and Taller, Robert A., 4,276,405, Cl. 528-58.000.
Franco, Bartolo, to Centro Ricerche Fiat S.p.A. Resilient suspension for the cab of an agricultural tractor. 4,275,918, Cl. 296-190.000.
Frang, Gosta M.: *See—*
Boisen Schmidt, Egon; Zechner, Josef K. S.; and Frang, Gosta M., 4,276,052, Cl. 23-301.000.
Frank B. Dehn & Co.: *See—*
Clements, Harold J., 4,275,869, Cl. 254-89.00H.
Franke, Heinrich; and Joppien, Hartmut, to Schering AG. Acylurea insecticides. 4,276,309, Cl. 424-322.000.
Franz, Helmut, to PPG Industries, Inc. Fluorocarbon treatment for reducing the reactivity of a glass surface and product. 4,276,350, Cl. 428-410.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef; and Brunninger, Manfred, 4,275,659, Cl. 104-2.000.
Fratty, Hector, to Cibie Projecteurs. Novel rectangular headlight for automobile. 4,276,583, Cl. 362-214.000.
French, John B.; and Muttoni, Oscar E., to Nomax Corporation. Individualized label application system. 4,276,112, Cl. 156-360.000.
Frey, Volker: *See—*
Lindner, Tassilo; Zeller, Norbert; Frey, Volker; Riedle, Rudolf; John, Peter; and Engelsberger, Georg, 4,276,426, Cl. 556-479.000.
Muller, Horst; and Frey, Volker, 4,276,423, Cl. 556-411.000.
Fricke, Gunter: *See—*
Singewald, Arno; Fricke, Gunter; Neitzel, Ulrich; and Geisler, Iring, 4,276,154, Cl. 209-3.000.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Kolaska, Johannes; and Grewe, Hans, 4,276,096, Cl. 148-16.600.
Friedman, Jon. Earth photo globe. 4,276,561, Cl. 358-78.000.
Friese, Karl-Hermann: *See—*
Topp, Bernhard; Friese, Karl-Hermann; and Haecker, Wolf-Dieter, 4,276,142, Cl. 204-195.00S.
Fritzsche Dodge & Olcott, Inc.: *See—*
Willis, Brian J.; and Dittrick, John W., 4,276,220, Cl. 260-345.100.
Froix, Michael F., to Celanese Corporation. Blend of polyarylene sulfide and wholly aromatic polyester. 4,276,397, Cl. 525-448.000.
Frontier Footwear Corporation: *See—*
Zeligman, Robert; and Zengerle, John R., 4,275,512, Cl. 36-11.500.
Frosch, Robert A.: *See—*
McLyman, W. T.; and Frosch, Robert A., 4,276,588, Cl. 363-56.000.
Varma, Indra K.; Fohlen, George M.; Parker, John A.; and Frosch, Robert A., 4,276,344, Cl. 428-260.000.
Fuchs, Rainer; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating arthropods with 3-phenoxybenzyl

2,2-dimethyl-3-vinyl-cyclopropane carboxylates. 4,276,306, Cl. 424-304.000.

Fuji Electric Co., Ltd.: *See*—
Tanaka, Akio; Nakajima, Yoshihisa; and Yokomori, Shinji, 4,275,806, Cl. 194-100.00A.

Fuji Kiko Company, Limited: *See*—
Matsuoka, Hideoki; and Kondo, Yoshinobu, 4,275,903, Cl. 280-803.000.

Fuji Photo Film Co., Ltd.: *See*—
Kato, Hisatoyo; Ishida, Masamitsu; and Matsumoto, Seiji, 4,276,473, Cl. 250-327.100.
Mifune, Hiroyuki; Miyasaka, Nobuaki; and Fuseya, Yoshiharu, 4,276,374, Cl. 430-611.000.

Fuji Xerox Co., Ltd.: *See*—
Ogasawara, Tsutomu; and Enomoto, Kazuo, 4,275,941, Cl. 312-223.000.

Fujisawa, Norio: *See*—
Okamoto, Eiichi; Fujisawa, Norio; and Hori, Masao, 4,276,605, Cl. 364-483.000.

Fujishiro, Takeshi; and Ozawa, Hiroshige, to Nissan Motor Company, Limited. Fluid flow measuring apparatus. 4,275,602, Cl. 73-861.220.

Fujita, Teizo; Ohashi, Toshiro; and Takimoto, Kouji, to Izumi Denki Corporation. Electronic timer. 4,276,631, Cl. 368-89.000.

Fujitsu Kiden Ltd.: *See*—
Hayashi, Yoshiro; Sugihara, Akira; Shimura, Takaki; Ishikawa, Kozo; Wada, Kiyoshi; Yamanaka, Eiji; and Senba, Shunsuke, 4,276,572, Cl. 360-12.000.

Fujitsu Limited: *See*—
Enomoto, Hiromu; Yasuda, Yasushi; Ohmichi, Hitoshi; and Mitono, Yoshiharu, 4,276,556, Cl. 357-52.000.
Hayashi, Yoshiro; Sugihara, Akira; Shimura, Takaki; Ishikawa, Kozo; Wada, Kiyoshi; Yamanaka, Eiji; and Senba, Shunsuke, 4,276,572, Cl. 360-12.000.
Yoneda, Yasuhiro; Kitakohji, Toshisuke; and Kitamura, Kenro, 4,276,365, Cl. 430-270.000.

Fukuda, Takashi: *See*—
Nagano, Hiroo; Oda, Terumi; and Fukuda, Takashi, 4,276,133, Cl. 204-145.00R.

Fukuda, Takeo; Murayama, Tadashi; and Urui, Kiyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Telephone exchange with time shared speech paths and selectively attenuated speech signals. 4,276,639, Cl. 370-62.000.

Fukumori, Yukitsugu; and Sone, Masazumi, to Nissan Motor Company, Limited. Ignition distributor. 4,275,690, Cl. 123-146.50A.

Fukumoto, Teruhisa: *See*—
Ogawa, Yoshinari; Fukumoto, Teruhisa; and Sakai, Kohichi, 4,276,208, Cl. 260-28.00R.

Fukushima, Masakazu; Ando, Kunio; and Fukuzawa, Kenichi, to Hitachi, Ltd. Electron gun for cathode-ray tube. 4,276,495, Cl. 315-16.000.

Fukuzawa, Kenichi: *See*—
Fukushima, Masakazu; Ando, Kunio; and Fukuzawa, Kenichi, 4,276,495, Cl. 315-16.000.

Fuller Company: *See*—
Kline, Kenneth H.; and Kramer, Walter W., 4,275,509, Cl. 34-57.00R.

Fuller, John R. D.: *See*—
Langley, Kenneth R.; and Fuller, John R. D., 4,275,990, Cl. 416-95.000.

Fulton, Martyn R.: *See*—
Sheffield, David J.; and Fulton, Martyn R., 4,275,582, Cl. 72-391.000.

Fuseya, Yoshiharu: *See*—
Mifune, Hiroyuki; Miyasaka, Nobuaki; and Fuseya, Yoshiharu, 4,276,374, Cl. 430-611.000.

Gabbay, Shlomo, to Shelhigh Inc. Prosthetic heart valve. 4,275,469, Cl. 3-1.500.

Gabriel, Richard J., to Matrix Toys, Inc. Removable tire for construction set joint element. 4,275,524, Cl. 46-23.000.

GAF Corporation: *See*—
Gruber, Bruce A.; and Lorenz, Donald H., 4,276,136, Cl. 204-159.220.
Hort, Eugene V.; and De Thomas, Waldo R., 4,276,215, Cl. 260-326.5FN.

Gallusser, David O.; Hemmer, Valentine J.; and Toombs, Gary C., to Bendix Corporation, The. Electrical contact and method for making same. 4,275,948, Cl. 339-218.00R.

Ganellin, Charon R.: *See*—
Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., 4,276,301, Cl. 424-273.00R.

Gappa, Gunther; Juntgen, Harald; and Klein, Jurgen, to Bergwerksverband GmbH. Apparatus for purification of waste water by means of active carbon. 4,276,178, Cl. 210-662.000.

Garber, Arnold L., to FMC Corporation. Periscopic sight with a unitary lens system. 4,275,639, Cl. 89-41.00E.

Gardner, Horace L.: *See*—
Engelberger, Joseph F.; Lindbom, Torsten H.; Dunne, Maurice J.; Perzley, William; Roberts, Wilbur N.; and Gardner, Horace L., 4,275,986, Cl. 414-730.000.

Garmany, William J., to International Telephone and Telegraph Corporation. Automatic synchronization for receivers of a navigational system. 4,276,552, Cl. 343-105.00R.

Garrett Corporation, The: *See*—
Hatch, Robert A.; Jansen, Harvey B.; Bolliger, Frederic E.; and Sumegi, Robert B., 4,275,558, Cl. 60-39.16R.

Garvey Corporation: *See*—
Garvey, Francis J.; and Buckminster, William F., 4,275,809, Cl. 198-624.000.

Garvey, Francis J.; and Buckminster, William F., to Garvey Corporation. Card conveyor with rope belt drive. 4,275,809, Cl. 198-624.000.

Gaskill, James R., Jr.: *See*—
Benedict, Douglas M.; and Gaskill, James R., Jr., 4,276,488, Cl. 307-272.00A.

Gast, Theodor; and Binder, Kurt, to Robert Bosch GmbH. Oscillation sensor, particularly combustion engine knock sensor. 4,275,586, Cl. 73-35.000.

Gavrilov, Anatoly N.: *See*—
Anoshko, Vladimir A.; Godin, Eduard M.; Gavrilov, Anatoly N.; Zverkov, Garik E.; Matskevich, Vladimir I.; Chepurin, Valentin M.; Semenov, Valentin P.; Grachev, Vladimir V.; and Butylin, Mikhail Y., 4,275,579, Cl. 72-59.000.

Gebruder Heller Verwaltungsgesellschaft mit beschrankter Haftung: *See*—
Kleine, Werner, 4,275,796, Cl. 175-385.000.

Gebruder Junghans GmbH: *See*—
Assmus, Friedrich; Flaig, Hans; Wolber, Robert; and Maurer, Roland, 4,276,634, Cl. 368-300.000.

Geersheuvels, Charles H.: *See*—
Verheijen, Egidius J. M.; and Geersheuvels, Charles H., 4,276,419, Cl. 546-164.000.

Geesen, Donald H., to PPG Industries Canada Ltd. Process of treating potassium chloride brine by evaporation and crystallization. 4,276,117, Cl. 159-47.00R.

Geiger, Werner, to Inventio AG. Molding machine for fabricating boxless molds. 4,275,783, Cl. 164-146.000.

Geisler, Diether; and Eckert, Joachim, to Beiersdorf AG. Housing with motor and solar cell. 4,275,525, Cl. 46-39.000.

Geisler, Iring: *See*—
Singewald, Arno; Fricke, Gunter; Neitzel, Ulrich; and Geisler, Iring, 4,276,154, Cl. 209-3.000.

Gelardi, Anthony; Gelardi, Paul; Swinburne, Stephen; Janiszewski, Michael; MacLeod, Robert, Jr.; Philippe, James; and Philippe, David, to Shape Inc. Container for a cassette. 4,275,943, Cl. 312-319.000.

Gelardi, Paul: *See*—
Gelardi, Anthony; Gelardi, Paul; Swinburne, Stephen; Janiszewski, Michael; MacLeod, Robert, Jr.; Philippe, James; and Philippe, David, 4,275,943, Cl. 312-319.000.

Gellatly, John S.; and Richter, Fred T., to Western Electric Company, Inc. Method for bonding a plastic case to a stub cable. 4,276,108, Cl. 156-244.240.

General Cable Corporation: *See*—
Bopp, Louis A., 4,276,251, Cl. 264-174.000.

General Company Limited: *See*—
Sugihara, Tetsuo, 4,276,334, Cl. 428-40.000.

General Dynamics: *See*—
Coerver, Leo E., 4,276,522, Cl. 333-1.100.

General Electric Company: *See*—
Blair, Lynn J., 4,275,559, Cl. 60-39.82S.
Bose, Bimal K., 4,276,505, Cl. 318-723.000.
Buzzell, Colby E., 4,275,585, Cl. 73-32.00A.
Ciarcia, Ronald D.; and Owens, Robert L., 4,276,526, Cl. 335-35.000.
Coker, Thomas G.; and LaConti, Anthony B., 4,276,146, Cl. 204-266.000.
Cotic, Dennis J., 4,276,476, Cl. 250-385.000.
DeWitte, Gordon J., 4,276,644, Cl. 371-25.000.
Lemmond, Charles Q., 4,276,335, Cl. 428-131.000.
Levinson, Lionel M.; Ellis, Howard F.; and Fishman, Herbert, 4,276,578, Cl. 361-127.000.
Markezich, Ronald L.; Olander, Walter K.; and Axelrod, Robert J., 4,276,233, Cl. 260-937.000.
Marvin, Ira E.; and Cowgill, Joseph R., 4,275,557, Cl. 60-39.030.
Schaeffer, Friedrich K.; and Brennan, Thomas F., 4,276,102, Cl. 156-85.000.
Srinivasa, Saroja R.; Shelley, Peter S.; and Hueschen, Robert E., 4,276,493, Cl. 313-330.000.
Tompkins, Russell E.; Walden, John P.; and Walker, Loren H., 4,276,510, Cl. 324-127.000.
Wright, Jack D.; and Snow, Barton H., 4,275,560, Cl. 60-226.00B.

General Foods Corporation: *See*—
Katz, Saul N.; and Gottesman, Martin, 4,276,315, Cl. 426-428.000.

General Motors Corporation: *See*—
Bayer, Dean M., 4,275,912, Cl. 293-120.000.
Bly, Kenneth B.; Gutwald, Mark J.; and Ludecke, Otto A., 4,276,066, Cl. 55-287.000.
McNamee, James W.; Homstad, Gerald E.; Vazquez-Cuervo, Alfonso; and Henry, Kenneth J., 4,276,640, Cl. 370-77.000.
Outland, Robert J., 4,276,071, Cl. 55-523.000.
Stoltman, Donald D., 4,275,697, Cl. 123-520.000.

General Porcelain Mfg. Co.: *See*—
Chester, Victor, 4,276,204, Cl. 252-519.000.

General Tire & Rubber Company, The: *See*—
Aggarwal, Sundar L.; Marker, Leon F.; Dudek, Thomas J.; and Herold, Robert J., 4,276,009, Cl. 425-130.000.

Genin, Paul. Folding hood for chair-lifts. 4,275,921, Cl. 297-184.000.

George, Odean F. Heat recovery in a laundry system. 4,275,510, Cl. 34-90.000.

Geosource Inc.: *See*—
Kahn, Twassul A.; Kiowski, John W.; and Lang, Douglas G., 4,276,620, Cl. 367-60.000.

Gerbert-Gaillard, Alain; and Morel, Robert, to Merlin Gerin. Multipole electrical circuit breaker with improved interchangeable trip units. 4,276,527, Cl. 335-39.000.

Gerdes, Donald F., to Binks Manufacturing Company. Fire control system for spray booth. 4,276,064, Cl. 55-217.000.

Gereg, Gordon A. Suction canister with membrane shut-off valve. 4,275,732, Cl. 128-276.000.

Gerstenberger, Friedrich; Loos, Wolfgang; and Straub, Dieter, to J. G. Anschutz, GmbH. Electro-mechanical triggering mechanism for fire arms. 4,275,521, Cl. 42-84.000.

Gessaga, Rinaldo, to Industrie Pirelli S.p.A. Process and apparatus for stitching the tread of pneumatic tires. 4,276,105, Cl. 156-128.00N.

Gestra-KSB Vertriebsgesellschaft mbH & Co. KG: *See*—
Foller, Werner; and Symanczyk, Hermann, 4,275,755, Cl. 137-195.000.

Gewerkschaft Eisenhutte Westfalia: *See*—
Merten, Gerhard; Breuer, Oswald; and Bernd, Steinkuhl, 4,275,927, Cl. 299-34.000.

Gik, Lev A. Rotary cutting tool. 4,275,626, Cl. 82-36.00R.

Gilbert, Terence; and Sheffield, David J. Breakstem riveting tool with stem disposal device. 4,275,583, Cl. 72-391.000.

Gillespie, George A., to UOP Inc. Screen for collection and distribution of process streams. 4,276,265, Cl. 422-311.000.

Gillessen, Dieter; and Lergier, William, to Hoffmann-La Roche Inc. Method for the determination of an amino or aminosulphonic acid. 4,276,049, Cl. 23-230.00B.

Gilson, Richard D.; Thurston, Marlin O.; Olson, Karl W.; and Ventola, Ronald W., to Ohio State University, The. Visual cue simulator. 4,276,029, Cl. 434-43.000.

Ginsberg, Guenter; and Horne, Thomas, to Coulter Electronics, Inc. System and program for chemical reaction observation with a moving photometer. 4,276,051, Cl. 23-230.00R.

Ginsberg, Guenter; and Hodgins, Bruce J., to Coulter Electronics, Inc. Sample and stat feeding system and sample tray. 4,276,258, Cl. 422-64.000.

Ginsberg, Guenter: *See*—
Drbal, Vladimir J.; Ginsberg, Guenter; Hodgins, Bruce J.; Richardson, John A.; Britton, Ted W.; Grimm, Richard M.; Bello, Ernesto; Rodriguez, Rodolfo R.; and Saltz, Ivan K., 4,276,260, Cl. 422-100.000.

Givens, Edwin N.: *See*—
Plank, Charles J.; Rosinski, Edward J.; and Givens, Edwin N., 4,276,151, Cl. 208-138.000.

Glaenzer, Spicer: *See*—
Guimbretiere, Pierre L., 4,275,799, Cl. 180-255.000.

Glover, William T. Bait box with passive circulation. 4,275,522, Cl. 43-56.000.

Godin, Eduard M.: *See*—
Anoshko, Vladimir A.; Godin, Eduard M.; Gavrilov, Anatoly N.; Zverkov, Garik E.; Matskevich, Vladimir I.; Chepurin, Valentin M.; Semenov, Valentin P.; Grachev, Vladimir V.; and Butylin, Mikhail Y., 4,275,579, Cl. 72-59.000.

Goldman, Michael B.; and Morton, George I., to RCA Corporation. A-C Rectifier circuit for powering monolithic integrated circuits. 4,276,592, Cl. 363-147.000.

Goldsmith, Arthur C.; and Kirkgasser, James P., to K-G Devices Corporation. Apparatus for separating ribbon cable. 4,275,630, Cl. 83-500.000.

Goldthorp, David C.: *See*—
Embree, Milton L.; Goldthorp, David C.; and Vogelpohl, David R., 4,276,448, Cl. 179-84.00T.

Goodhue, Charles T.; Esders, Theodore W.; and Masurekar, Prakash S., to Eastman Kodak Company. Creatinine iminohydrolase free from urease activity. 4,276,377, Cl. 435-18.000.

Goodrich, Roger S.: *See*—
Middleman, Lee M.; and Goodrich, Roger S., 4,276,466, Cl. 219-523.000.

Goodyear Aerospace Corporation: *See*—
Baird, Roy W.; Berger, Robert E.; and Kirk, Richard L., 4,275,932, Cl. 301-39.00T.

Goodyear Tire & Rubber Company, The: *See*—
Kerscher, Frederick C.; and Nowacki, John J., 4,276,261, Cl. 422-131.000.
Riggs, Robert S., 4,276,104, Cl. 156-123.00R.
Wolfe, Merritt W., 4,276,103, Cl. 156-96.000.

Gorbunov, Oleg P.: *See*—
Redikultsev, Jury V.; Shkidchenko, Alexandr N.; Gorbunov, Oleg P.; and Litvinenko, Leonid A., 4,276,264, Cl. 422-307.000.

Gordon, Abraham: *See*—
Adler, Stanford L., Sr.; Gordon, Abraham; and Ornstein, Leonard, 4,276,253, Cl. 264-247.000.

Gordon, Leonard. Hydrostatic relief valve. 4,276,163, Cl. 210-136.000.

Gori & Zucchi S.p.A.: *See*—
Bichi, Pasquale, 4,275,555, Cl. 59-3.000.

Gorlitz, Frank Otto, to Buhler-Miag GmbH. Screen for a screening machine. 4,276,158, Cl. 209-255.000.

Gotoh, Bonpei. Semiautomatic rotary razor. 4,275,496, Cl. 30-43.600.

Gottesman, Martin: *See*—
Katz, Saul N.; and Gottesman, Martin, 4,276,315, Cl. 426-428.000.

Gottron, Richard N.; and Cox, Lyndon S., to United States of America, Army. Safing and arming signature for fuzes. 4,275,658, Cl. 102-210.000.

Gould Inc.: *See*—
Myers, Felix E., 4,276,457, Cl. 200-153.00G.

Gould Inc. Modicon Division: *See*—
Morley, Richard E., 4,276,594, Cl. 364-200.000.

Goyal, Ramesh C.: *See*—
Johnston, Craig E.; and Goyal, Ramesh C., 4,276,513, Cl. 330-9.000.

Grachev, Vladimir V.: *See*—
Anoshko, Vladimir A.; Godin, Eduard M.; Gavrilov, Anatoly N.; Zverkov, Garik E.; Matskevich, Vladimir I.; Chepurin, Valentin M.; Semenov, Valentin P.; Grachev, Vladimir V.; and Butylin, Mikhail Y., 4,275,579, Cl. 72-59.000.

Gragg, F. Michael; and Self, James, to Occidental Research Corporation; and Occidental Chemical Company. Start-up procedure in producing phosphoric acid by the hemihydrate process. 4,276,270, Cl. 423-167.000.

Graham, Kenneth A., to Chrysler Corporation. Throttle body having a deflector for the throttle blade and improved atomization. 4,275,700, Cl. 123-590.000.

Grams, Harold: *See*—
Karayannis, Nicholas M.; Grams, Harold; and Skryantz, John S., 4,276,191, Cl. 252-429.00C.

Graphic Arts Manufacturing Company: *See*—
Kuhnel, Donald S., 4,276,615, Cl. 365-45.000.

Gray, Charles E., deceased; and Gray, Emma D. W., executrix. Well casing spider. 4,275,487, Cl. 24-263.0DC.

Gray, Charles E., deceased; and by Gray, Emma D. W., executrix. Combined well casing spider and elevator. 4,275,488, Cl. 24-263.0DC.

Gray, Emma D. W., executrix: *See*—
Gray, Charles E., deceased; and Gray, Emma D. W., executrix, 4,275,487, Cl. 24-263.0DC.
Gray, Charles E., deceased; and Gray, Emma D. W., executrix, 4,275,488, Cl. 24-263.0DC.

Graziano, Helen V. Method and composition for modifying filamentous keratins. 4,275,748, Cl. 132-7.000.

Green, George E., to Ciba-Geigy Corporation. Reinforced composites containing unsaturated polyimide resins. 4,276,352, Cl. 428-473.500.

Green, Ian M., to E M I Limited. Mapping systems. 4,276,618, Cl. 367-11.000.

Greenfield, Charles; and Bonanno, Anthony J., to Hanover Research Corporation. Process and apparatus for dehydrating waste solids concentrates. 4,276,115, Cl. 159-1.0RW.

Greenhouse, Hyman D. Syringe and needle destroyer. 4,275,628, Cl. 83-167.000.

Grewe, Hans: *See*—
Kolaska, Johannes; and Grewe, Hans, 4,276,096, Cl. 148-16.600.

Grgurich, William A.; Niles, Albert B.; and Updyke, Kenneth W., to Caterpillar Tractor Co. Fuel injection nozzle. 4,275,844, Cl. 239-533.300.

Grigo, Ulrich: *See*—
Arlt, Klaus-Peter; Grigo, Ulrich; and Binsack, Rudolf, 4,276,193, Cl. 252-429.00B.

Grimaldi, Anthony: *See*—
Grimaldi, Anthony J.; and Fabiano, Anthony, 4,275,883, Cl. 273-26.00A.

Grimaldi, Anthony J.; and Fabiano, Anthony, to Grimaldi, Anthony. Pitching target with ball return. 4,275,883, Cl. 273-26.00A.

Grimm, Peter: *See*—
Becker, Hans; Grimm, Peter; Ranke, Gerhard; and Roth, Dieter, 4,276,057, Cl. 55-40.000.

Grimm, Richard M.: *See*—
Drbal, Vladimir J.; Ginsberg, Guenter; Hodgins, Bruce J.; Richardson, John A.; Britton, Ted W.; Grimm, Richard M.; Bello, Ernesto; Rodriguez, Rodolfo R.; and Saltz, Ivan K., 4,276,260, Cl. 422-100.000.

Grimmer, Johannes: *See*—
Kilpper, Gerhard; and Grimmer, Johannes, 4,276,433, Cl. 562-458.000.

Groenendaal, Gradus C.; and Aagaard, Einar A., to U.S. Philips Corporation. Receiver for digital signals in line code. 4,276,649, Cl. 371-55.000.

Grogler, Gerhard: *See*—
Schwindt, Jurgen; and Grogler, Gerhard, 4,276,386, Cl. 521-160.000.

Groothuis, Gerrit J.: *See*—
Engelhardt, Manfred; Reinink, Jan; De Vries, Jochem J.; Trees, Ferdinand M.; Tietjens, Eduard W.; and Groothuis, Gerrit J., 4,275,497, Cl. 30-43.600.

Grosser, Richard W.; and Long, Virgil L., Sr., to AMF Incorporated. Home exercise gym. 4,275,882, Cl. 272-117.000.

Groth, Hugh F.; Hunt, Guilbert M.; and Shaner, Ronald E., to Lambert Corporation. Compactor refuse and other materials. 4,275,651, Cl. 100-229.00A.

Gruber, Bruce A.; and Lorenz, Donald H., to GAF Corporation. Radiation curable coating composition comprising an ethylenically unsaturated oligomer and an ethylenically unsaturated copolymerizable ultra-violet absorber. 4,276,136, Cl. 204-159.220.

Gruber, Morton A. Combined incense burner and pipe. 4,275,746, Cl. 131-180.000.

Gruber, Wolfgang: *See*—
Hundt, Dieter; Sedelmeyer, Marianne; Roschlau, Peter; Stahler, Fritz; and Gruber, Wolfgang, 4,276,376, Cl. 435-17.000.

Grunstad, Jerome A., to Ketcham & McDougall, Inc. Wall mounted telephone index. 4,275,519, Cl. 40-378.000.

Gruppo Lepetit S.p.A.: *See*—
Parenti, Francesco; Coronelli, Carolina; Tamoni, Giorgio; and Lancini, Giancarlo, 4,276,382, Cl. 435-253.000.

Gruson, Michel, to Ducellier & Cie. Motor vehicle battery charging installation. 4,276,577, Cl. 361-91.000.

Grutzmann, Sigmar: *See*—
Siglow, Joachim; Grutzmann, Sigmar; and Schenk, Erwin, 4,276,642, Cl. 370-100.000.
Grychtol, Klaus: *See*—
Degen, Hans-Jurgen; and Grychtol, Klaus, 4,276,415, Cl. 542-435.000.
Gschwendtner, Jorg: *See*—
Arzubi, Luis M.; Clemen, Rainer; and Gschwendtner, Jorg, 4,276,487, Cl. 307-270.000.
GTE Laboratories Incorporated: *See*—
Carlsen, W. John; Dakss, Mark L.; and Lambert, Gary M., 4,276,113, Cl. 156-502.000.
GTE Products Corporation: *See*—
Boudrot, Robert J.; Shambaugh, John S.; and Zeltzer, Hyman, 4,276,361, Cl. 429-186.000.
Guazzone, Bruno: *See*—
Muller, Hans; and Guazzone, Bruno, 4,276,166, Cl. 210-327.000.
Guimbretiere, Pierre L., to Glaenzer, Spicer. Wheel hub and homokinetic joint assembly. 4,275,799, Cl. 180-255.000.
Gulf Oil Corporation: *See*—
Karim, Khalid A.; and Rea, James H., 4,276,111, Cl. 156-308.200.
Gulf & Western Corporation: *See*—
Anderson, Verner; Logan, David J.; and Wood, Kenneth O., 4,275,627, Cl. 83-152.000.
Gustafson, Inc.: *See*—
Weber, Joseph A., 4,275,682, Cl. 118-303.000.
Gutierrez Atencio, Francisco J. Reversible pump-turbine. 4,275,989, Cl. 415-129.000.
Gutnick, David L.; and Rosenberg, Eugene, to Biotechnologie Aktiengesellschaft fur Emulsan. Cleaning oil-contaminated vessels with α-emulsans. 4,276,094, Cl. 134-10.000.
Gutoff, Edgar B., to Polaroid Corporation. Method and apparatus for dynamic wetting angle measurement. 4,275,587, Cl. 73-64.400.
Gutwald, Mark J.: *See*—
Bly, Kenneth B.; Gutwald, Mark J.; and Ludecke, Otto A., 4,276,066, Cl. 55-287.000.
Gwynn, Donald E., to Eastman Kodak Company. Hydrocarbon resin and process for its preparation. 4,276,396, Cl. 525-338.000.
Gwynn, Eric C., to Singer Company, The. Gunnery training system. 4,276,028, Cl. 434-20.000.
Gyorgy, Fabry; and Takacs, Istvan, to Richter Gedeon Vegyeszeti Gyar Rt. Packing of equipment for the purpose of contacting mainly gaseous and liquid mediums. 4,276,244, Cl. 261-155.000.
Haakonsen, Haakon: *See*—
Mock, Arthur E., 4,276,124, Cl. 202-236.000.
Habegger, Millard A.; and Hooker, Ross B., III, to International Business Machines Corporation. System for enhanced light uniformity in a document scanning system. 4,275,960, Cl. 355-68.000.
Habib, Fred G., Jr. Remote cycle alarm system. 4,276,540, Cl. 340-63.000.
Haecker, Wolf-Dieter: *See*—
Topp, Bernhard; Friese, Karl-Hermann; and Haecker, Wolf-Dieter, 4,276,142, Cl. 204-195.00S.
Haesly, Barry F.; and Jarman, Hall E., to Texas Instruments Incorporated. Printed circuit board switch. 4,276,460, Cl. 200-292.000.
Haggard, Roger L.; Seitchik, Jerold A.; and Rao, T. R. N., to Texas Instruments Incorporated. Method and apparatus for detecting errors in a data set. 4,276,646, Cl. 371-37.000.
Hahn, Allen W.; Nichols, Michael F.; Sharma, Ashok K.; and Hellmuth, Eckhard W., to University of Missouri, The Curators of the. Oxygen electrode and method for preparation thereof. 4,276,144, Cl. 204-195.00P.
Hahn, Andreas, to Messerschmitt-Boelkow-Biochm Gesellschaft mit beschrankter Haftung. Infusion pump. 4,276,004, Cl. 417-479.000.
Haight, Ehrick K. Combination feeder and sifter. 4,276,157, Cl. 209-246.000.
Haire, Darrell W., to Herr, Michael; and Johnson, Keith. Laminate cutting assembly. 4,275,501, Cl. 30-374.000.
Hairston, Thomas J.: *See*—
Monnerat, Georgia A.; Ham, George E.; Hairston, Thomas J.; and Hatch, Melvin J., 4,276,406, Cl. 528-92.000.
Hajos, Zoltan G.; and Wachter, Michael P., to Ortho Pharmaceutical Corporation. Synthesis of dioxabicyclo[3.2.1]octanes and oxepanes. 4,276,216, Cl. 260-340.600.
Hall, Robert A.: *See*—
Szymaszek, Paul G.; and Hall, Robert A., 4,275,570, Cl. 62-468.000.
Halle, Reidar: *See*—
Muenchow, John R.; Pastorino, Ronald L.; Halle, Reidar; and Lewis, Roger N., 4,276,247, Cl. 264-54.000.
Halliburton Company: *See*—
Knox, Lloyd C.; and Sullaway, Bob L., 4,275,974, Cl. 405-225.000.
Martin, Larry D., 4,276,185, Cl. 252-87.000.
Halpern, Peter H.; and Lawrence, Charles E., to Datapoint Corporation. Pulse shaping network for disc read circuitry. 4,276,573, Cl. 360-45.000.
Ham, George E.: *See*—
Monnerat, Georgia A.; Ham, George E.; Hairston, Thomas J.; and Hatch, Melvin J., 4,276,406, Cl. 528-92.000.
Hamisch, Paul H., Jr.; and Pabodie, Robert M., to Monarch Marking Systems, Inc. Selective printing apparatus. 4,275,654, Cl. 101-110.000.
Hammann, Ingeborg: *See*—
Fuchs, Rainer; Hammann, Ingeborg; and Stendel, Wilhelm, 4,276,306, Cl. 424-304.000.
Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; Krehan, Ingomar; Kraus, Peter; and Stendel, Wilhelm, 4,276,310, Cl. 424-322.000.
Hanover Research Corporation: *See*—
Greenfield, Charles; and Bonanno, Anthony J., 4,276,115, Cl. 159-1.0RW.
Hansel, Allen B.; and Natarajan, Thiagarajan, to Perkin-Elmer Corporation, The. Current sharing modular power system. 4,276,590, Cl. 363-71.000.
Hansen, Paul L., to Beckman Instruments, Inc. Transfer system for multi-variable control units. 4,276,593, Cl. 364-119.000.
Hanson, George C.: *See*—
Beebe, Otto W.; Lee, Ernest O.; Subrin, Richard I.; Brightman, Barrie; and Hanson, George C., 4,276,451, Cl. 179-175.20C.
Hanson, Lloyd D.: *See*—
Purton, Robert M.; and Hanson, Lloyd D., 4,275,842, Cl. 239-446.000.
Happ, Lawrence R.: *See*—
Anderson, Carl R.; Wellwood, James J.; and Happ, Lawrence R., 4,275,888, Cl. 369-74.000.
Harbeson, William D., to Kay Elemetrics Corp. Speech analysis apparatus. 4,276,445, Cl. 179-1.0SC.
Harder, Arthur J., Jr., to Coach and Car Equipment Corporation. Back shroud for seat. 4,275,925, Cl. 297-444.000.
Hardigg Industries, Inc.: *See*—
Hardigg, James S.; and Strzegowski, Joseph C., Jr., 4,276,360, Cl. 429-175.000.
Hardigg, James S.; and Strzegowski, Joseph C., Jr., to Hardigg Industries, Inc. Battery jar cover and welding method therefor. 4,276,360, Cl. 429-175.000.
Hardt, Dietrich; Humme, Gert; Ott, Karl-Heinz; and Braese, Hans-Eberhard, to Bayer Aktiengesellschaft. High-impact thermoplastic vinyl chloride polymer moulding composition. 4,276,391, Cl. 525-71.000.
Harigaya, Isao; and Yamataka, Akihiro, to Canon Kabushiki Kaisha. Date data computer. 4,276,606, Cl. 364-709.000.
Harney, Marilyn J., to Catalyst Research Corporation. Depolarizers for lithium halide batteries. 4,276,362, Cl. 429-213.000.
Harnisch, Heink: *See*—
Cremer, Joseph; and Harnisch, Heink, 4,276,343, Cl. 428-254.000.
Harnischfeger Corporation: *See*—
Putney, Gordon A., 4,275,803, Cl. 188-134.000.
Harrington, John H.: *See*—
Novinski, Edward R.; and Harrington, John H., 4,276,353, Cl. 428-558.000.
Harrison, Charles H.: *See*—
Andersen, Harold W.; Andersen, Shirley R.; Zaner, Clifford; and Harrison, Charles H., 4,276,263, Cl. 422-292.000.
Hartford, Thomas W.; and Kessler, James A., to Bendix Corporation, The. Oxygen sensor feedback loop digital electronic signal integrator for internal combustion engine control. 4,276,600, Cl. 364-431.000.
Hartman, Don A. Bock holder. 4,275,863, Cl. 248-448.000.
Harvey, Albert J., to Diamond International Corporation. Heat transfer labeling machine. 4,275,856, Cl. 242-75.440.
Hashimoto Forming Kogyo Company Limited: *See*—
Kamihama, Kiyoshi, 4,275,930, Cl. 301-37.0SS.
Hashimoto, Takeji; Okumoto, Kiyofumi; and Andoh, Masayasu, to Dainippon Screen Seizo Kabushiki Kaisha. Automatic needle selection mechanism for a knitting machine. 4,275,573, Cl. 66-75.200.
Hassler, Dieter, to Siemens Aktiengesellschaft. Process and installation for producing and recording ultrasonic sectional images. 4,275,595, Cl. 73-606.000.
Hasumi, Ryoichi: *See*—
Nishikawa, Yasuhisa; and Hasumi, Ryoichi, 4,275,606, Cl. 74-10.390.
Haswell, Walter T.; Stasko, William; and Dax, F. Robert, to Crucible Inc. Powder-metallurgy vanadium-containing tungsten-type high-speed steel. 4,276,087, Cl. 75-243.000.
Hatch, Melvin J.: *See*—
Monnerat, Georgia A.; Ham, George E.; Hairston, Thomas J.; and Hatch, Melvin J., 4,276,406, Cl. 528-92.000.
Hatch, Robert A.; Jansen, Harvey B.; Bolliger, Frederic E.; and Sumegi, Robert B., to Garrett Corporation, The. Gas turbine engine fuel governor. 4,275,558, Cl. 60-39.16R.
Hattori, Hiroyuki: *See*—
Tachika, Tetsuji; Sakamaki, Hisashi; and Hattori, Hiroyuki, 4,275,958, Cl. 355-14.00R.
Haugen, Marilyn M.: *See*—
Ludwa, Raymond J.; Forry, Mark E.; and Haugen, Marilyn M., 4,276,338, Cl. 428-137.000.
Haverl, Ronald A.: *See*—
Quedens, Phillipp J.; Haverl, Ronald A.; and Stoller, Milton, 4,275,597, Cl. 73-618.000.
Hawkins, John J., to Beckman Instruments, Inc. Solid state ion selective electrodes. 4,276,141, Cl. 204-195.00M.
Hayakawa, Shigeru: *See*—
Mitsuyu, Tsuneo; Wasa, Kiyotaka; and Hayakawa, Shigeru, 4,276,535, Cl. 338-22.00R.
Hayashi, Torahiko. Method for processing bread dough. 4,276,317, Cl. 426-501.000.
Hayashi, Yoshimasa: *See*—
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Hayashi, Yoshiro; Sugihara, Akira; Shimura, Takaki; Ishikawa, Kozo; Wada, Kiyoshi; Yamanaka, Eiji; and Senba, Shunsuke, to Japanese National Railways; Fujitsu Limited; and Fujitsu Kiden Ltd. Automatic message announcement system. 4,276,572, Cl. 360-12.000.
Hayashibara, Ken: *See*—
Sugimoto, Kaname; and Yuen, Shokichi, 4,276,282, Cl. 424-85.000.

Hayden, Rodney, to TRW Inc. Timed electric switch. 4,276,483, Cl. 307-10.00R.

Hayes, Allan, to Davy-Loewy Limited. Support vehicle for roll assemblies. 4,275,580, Cl. 72-239.000.

Haynes, George R., to Shell Oil Company. N-Phenethylaminopropiophenones as lipogenesis inhibitors. 4,276,307, Cl. 424-304.000.

Hazen Research, Inc.: *See*—
Kindig, James K.; and Turner, Ronald L., 4,276,081, Cl. 75-7.000.
Reynolds, James E.; and Williams, Alan R., 4,276,084, Cl. 75-101.00R.

Heady, Robert E., to CPC International Inc. Preparation of high fructose syrups from sucrose. 4,276,379, Cl. 435-94.000.

Heberley, Jeffrey R.: *See*—
Costantino, Joseph A.; Heberley, Jeffrey R.; Neimark, Jerry; and Weiner, Thomas E., 4,276,472, Cl. 250-214.00B.

Hecke, Emil, to Degussa AG. Process for the production of finely divided oxides of metals or silicon. 4,276,274, Cl. 423-336.000.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Froth flotation process using condensates of hydroxyethylethylenediamines as collectors for siliceous material. 4,276,156 Cl. 209-166.000.

Heimann GmbH: *See*—
Meyer, Juergen; Schaaf, Norbert; and Kunze, Claus, 4,276,534, Cl. 338-15.000.

Heinzerling, Jurgen; and Rieckeheer, Rainer, to U.S. Philips Corporation. Magnet coil arrangement for generating a homogeneous magnetic field for magnetic resonance arrangements. 4,276,529, Cl. 335-300.000.

Heitmann, Jurgen; Illetschko, Gerhard; and Maly, Hans-Peter, to Robert Bosch GmbH. Representing a video signal upon the picture screen of a video display device. 4,276,563, Cl. 358-139.000.

Heiwado Boeki Kabushiki Kaisha: *See*—
Hiraishi, Mamoru, 4,276,632, Cl. 368-203.000.

Helbig, Klaus, to Prakla - Seismos GmbH. Method for monitoring subsurface combustion and gasification processes in coal seams. 4,275,787, Cl. 166-251.000.

Heller, Adam; Tai, King L.; and Vadimsky, Richard G., to Bell Telephone Laboratories, Incorporated. Photoinduced migration of silver into chalcogenide layer. 4,276,368, Cl. 430-323.000.

Hellmuth, Eckhard W.: *See*—
Hahn, Allen W.; Nichols, Michael F.; Sharma, Ashok K.; and Hellmuth, Eckhard W., 4,276,144, Cl. 204-195.00P.

Hemmer, Valentine J.: *See*—
Gallusser, David O.; Hemmer, Valentine J.; and Toombs, Gary C., 4,275,948, Cl. 339-218.00R.

Hendricks, Udo-Winfried; and Jakobs, Karlhans, to Bayer Aktiengesellschaft. Process for dyeing polyester fibres of fibre mixtures containing them. 4,276,046, Cl. 8-532.000.

Hendrickson, Kenneth: *See*—
Rady, Bruce A.; Wells, Thomas R.; and Hendrickson, Kenneth, 4,276,470, Cl. 235-463.000.

Henne, Werner; and Dunweg, Gustav, to Akzo N.V. Cellulosic membrane for blood dialysis. 4,276,172, Cl. 210-490.000.

Henneman, Richard C.; Burdon, Kenneth A.; and Bruce, Joseph R., to PACCAR Inc. Apparatus for controlling speed and direction of a vehicular towing winch. 4,275,870, Cl. 254-361.000.

Hennessy Products, Inc.: *See*—
Mowles, Kenneth L., 4,275,661, Cl. 105-199.00C.

Hennig, Falke, to Fairchild Camera & Instrument Corp. Merged bipolar/field-effect bistable memory cell. 4,276,616, Cl. 365-177.000.

Henry, Kenneth J.: *See*—
McNamee, James W.; Homstad, Gerald E.; Vazquez-Cuervo, Alfonso; and Henry, Kenneth J., 4,276,640, Cl. 370-77.000.

Henson, Kenneth; and Terrell, Christopher, to Chloride Group Limited. Electric batteries. 4,276,358, Cl. 429-97.000.

Herb, Armin; and Lang, Gusztav, to Hilti Aktiengesellschaft. Fastening element assembly. 4,275,637, Cl. 411-78.000.

Herold, Robert J.: *See*—
Aggarwal, Sundar L.; Marker, Leon F.; Dudek, Thomas J.; and Herold, Robert J., 4,276,009, Cl. 425-130.000.

Herr, Michael: *See*—
Haire, Darrell W., 4,275,501, Cl. 30-374.000.

Herrmann, George: *See*—
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Hesston Corporation: *See*—
Swenson, Edward L.; and Ratzlaff, Howard L., 4,275,550, Cl. 56-341.000.

Hetzel, Thomas R.; and LaBelle, Charles, to Thomas Industries, Inc. Air compressor with ramped intake valve. 4,275,999, Cl. 417-299.000.

Hewlett-Packard Company: *See*—
Dugas, Roger A., 4,275,765, Cl. 137-625.480.

Higginbotham, Eugene E., to Christensen, Inc. Electroplated diamond milling cutter. 4,275,528, Cl. 51-206.00P.

Higuchi, Chojiro: *See*—
Sakai, Katsuya; Mita, Ryuichi; Kato, Toshio; Higuchi, Chojiro; and Murakami, Hisamichi, 4,276,187, Cl. 252-186.000.

Hihara, Toshio: *See*—
Imahori, Seiichi; Hihara, Toshio; Yomeyama, Tomio; and Hirota, Takao, 4,276,047, Cl. 8-532.000.

Hildebrand, Clair E.: *See*—
Van Hook, James P.; Hildebrand, Clair E.; and Chan, Chong H., 4,276,276, Cl. 423-385.000.

Hilti Aktiengesellschaft: *See*—
Herb, Armin; and Lang, Gusztav, 4,275,637, Cl. 411-78.000.

Hilton, Graham H., to De La Rue Systems Limited. Sheet counting apparatus. 4,275,667, Cl. 109-44.000.

Hinson, Betty R. Apparatus for making a handcrafted pile rug. 4,275,515, Cl. 38-102.910.

Hiraishi, Mamoru, to Heiwado Boeki Kabushiki Kaisha. Hatch locking mechanism for the battery compartment of a wristwatch. 4,276,632, Cl. 368-203.000.

Hirota, Takao: *See*—
Imahori, Seiichi; Hihara, Toshio; Yomeyama, Tomio; and Hirota, Takao, 4,276,047, Cl. 8-532.000.

Hiruma, Hideo; and Maruhashi, Yukio, to Koa Denshi Kogyo Kabushiki Kaisha. Object confirming apparatus. 4,276,621, Cl. 367-97.000.

Hisazumi, Nobuyuki; Yamamoto, Masataka; and Uehara, Tsutomu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Vacuum packaging method. 4,275,544, Cl. 53-433.000.

Hitachi Chemical Company, Ltd.: *See*—
Iwami, Etsuji; and Saito, Takayuki, 4,276,388, Cl. 525-48.000.

Hitachi, Ltd.: *See*—
Fukushima, Masakazu; Ando, Kunio; and Fukuzawa, Kenichi, 4,276,495, Cl. 315-16.000.
Ienaka, Masanori; Yamamura, Masahiro; Watanabe, Kazuo; and Kominami, Yasuo, 4,276,442, Cl. 179-1.00A.
Kohyama, Masaharu; and Ishibashi, Tadashi, 4,275,494, Cl. 29-592.00R.
Kuroda, Michio; Nakamura, Shozo; Tsukahara, Satoshi; Akatu, Yasuaki; Sugita, Shigehisa; Kaneko, Kojiro; Sakaguchi, Seiichiro; and Oshima, Ryoichiro, 4,275,563, Cl. 60-673.000.
Manabe, Toshikatsu; Nonogaki, Saburo; Morishita, Hajime; Uchino, Shoichi; Tomita, Yoshifumi; Nishizawa, Masahiro; Yokomizo, Hiroshi; and Ohmatoi, Susumu, 4,276,363, Cl. 430-28.000.
Nagase, Hiroshi; Okuyama, Toshiaki; and Kubota, Yuzuru, 4,276,504, Cl. 318-721.000.
Obara, Sanshiro; Tokuda, Hiroatsu; Konno, Akihiko; and Nakamura, Hideo, 4,276,602, Cl. 364-431.000.
Oka, Hitoshi; and Nakamura, Kenji, 4,276,323, Cl. 427-8.000.
Okawa, Tadashi; Honbu, Mitsuyuki; Matsuda, Yasuo; Shibata, Takanori; and Kawaguchi, Toshio, 4,276,589, Cl. 363-71.000.
Shirasu, Hirotoshi, 4,276,447, Cl. 179-18.0FG.
Suzuki, Ryo, 4,276,612, Cl. 365-12.000.
Takami, Katsumi; and Matsuzawa, Takashi, 4,276,633, Cl. 368-227.000.
Takano, Yukio; Ogirima, Masahiko; Aoki, Shigeru; Maki, Michiyoshi; and Kato, Shigeo, 4,276,114, Cl. 156-645.000.
Tokuda, Hiroatsu; Morinaga, Shigeki; and Nakamura, Hideo, 4,276,601, Cl. 364-431.000.
Watanabe, Yasuaki; Okabe, Yukio; Kojima, Shinichi; and Sato, Mitsuya, 4,276,560, Cl. 358-28.000.

Hjort, Bo, to Siemens Aktiengesellschaft. Measuring device for measuring the bioelectrical activity of the central nervous system. 4,275,743, Cl. 128-731.000.

Ho, Morris D.: *See*—
Dugger, Doyle L.; and Ho, Morris D., 4,275,589, Cl. 73-146.000.

Ho, Pang T.; and Rubin, Michael D., to Ford Aerospace & Communications Corp. Hermetically sealed active microwave integrated circuit. 4,276,558, Cl. 357-74.000.

Hock, Frederick D.: *See*—
Lichti, Robert D.; and Hock, Frederick D., 4,275,979, Cl. 414-251.000.

Hodges, Everett L. Down hole pump with bottom receptor. 4,275,926, Cl. 299-17.000.

Hodgins, Bruce J.: *See*—
Drbal, Vladimir J.; Ginsberg, Guenter; Hodgins, Bruce J.; Richardson, John A.; Britton, Ted W.; Grimm, Richard M.; Bello, Ernesto; Rodriguez, Rodolfo R.; and Saltz, Ivan K., 4,276,260, Cl. 422-100.000.
Ginsberg, Guenter; and Hodgins, Bruce J., 4,276,258, Cl. 422-64.000.

Hoechst Aktiengesellschaft: *See*—
Cremer, Joseph; and Harnisch, Heink, 4,276,343, Cl. 428-254.000.
Ruschepaul, Klaus-Jorg, 4,275,878, Cl. 271-170.000.

Hoffacker, Franz: *See*—
Pohler, Friedmar; Falk, Hans; Muller, Josef; Klein, Hans J.; and Hoffacker, Franz, 4,276,324, Cl. 427-10.000.

Hoffmann, Hellmut: *See*—
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Hoffmann-La Roche Inc.: *See*—
Gillessen, Dieter; and Lergier, William, 4,276,049, Cl. 23-230.00B.
Muller, Jean-Claude; and Ramuz, Henri, 4,276,417, Cl. 544-198.000.
Suchy, Milos, 4,276,305, Cl. 424-301.000.

Hoffmann, Werner: *See*—
Schoettle, Klaus; Hoffmann, Werner; Kaemmer, Eduard; Boehlke, Klaus; and Lewin, Helmut, 4,276,575, Cl. 360-130.210.

Hogan, Edward P.: *See*—
Krantz, Leonard A.; and Hogan, Edward P., 4,275,945, Cl. 339-147.00R.

Hohlein, Peter; and Schoeps, Jochen, to Bayer Aktiengesellschaft. Water-dilutable lacquer binders for chemically resistant coatings. 4,276,210, Cl. 260-29.4UA.

Holladay, Harry P., to Monsanto Company. Processes for sealing hollow fiber membranes arranged in the form of a bundle. 4,276,249, Cl. 264-139.000.

Hollux S.A.: *See*—
de Lockerente, Serge R.; and De Laever, Jacques, 4,276,269, Cl. 423-101.000.

Holmes, Lambert, to Dema Engineering Co. Fluid pump assembly. 4,276,001, Cl. 417-401.000.

Holmes, Phillip R.; Kehler, James A.; and Bogusky, Ronald A. Torque limiting drive system. 4,275,572, Cl. 64-30.00D.
Holweg, Rainer; and Kluting, Bernd, to Keiper Automobiltechnik GmbH & Co. KG. Safety support for adjustable vehicle seats. 4,275,914, Cl. 296-65.00R.
Homstad, Gerald E.: *See—*
McNamee, James W.; Homstad, Gerald E.; Vazquez-Cuervo, Alfonso; and Henry, Kenneth J., 4,276,640, Cl. 370-77.000.
Honbu, Mitsuyuki: *See—*
Okawa, Tadashi; Honbu, Mitsuyuki; Matsuda, Yasuo; Shibata, Takanori; and Kawaguchi, Toshio, 4,276,589, Cl. 363-71.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Nishikawa, Masao; Aoyama, Toshihiko; and Sato, Yoichi, 4,275,798, Cl. 180-143.000.
Okada, Motohiro, 4,275,901, Cl. 280-741.000.
Okubo, Kiyokazu; and Nakayama, Hiroshi, 4,275,614, Cl. 74-476.000.
Honeywell Information Systems Inc.: *See—*
Flynn, Richard T.; and Kindell, Jerry L., 4,276,596, Cl. 364-200.000.
Petryk, Edward M., Jr., 4,276,656, Cl. 455-608.000.
Honig, Milton L.; and Weil, Edward D., to Stauffer Chemical Company. Process for preparing pentaerithritol methylphosphonates having at least one hydroxyl group of pentaerithritol unesterified. 4,276,234, Cl. 260-982.000.
Hooker, Ross B., III: *See—*
Habegger, Millard A.; and Hooker, Ross B., III, 4,275,960, Cl. 355-68.000.
Hopkins, Donald L., to Alf Hannaford & Co. Pty. Ltd. Apparatus for the handling of sheep. 4,275,685, Cl. 119-20.000.
Hopkins, Evan L.; and Thomas, Robert R., to Hopkins Manufacturing Corporation. Ice scraper. 4,275,476, Cl. 15-236.00R.
Hopkins, Ivan J.: *See—*
Roeschlaub, John G.; and Hopkins, Ivan J., 4,276,155, Cl. 209-10.000.
Hopkins Manufacturing Corporation: *See—*
Hopkins, Evan L.; and Thomas, Robert R., 4,275,476, Cl. 15-236.00R.
Hori, Masao: *See—*
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Hori, Teruo: *See—*
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Horn, Michael, to Optsonic Research Associates, Inc. Optical bichromatic position finder. 4,275,596, Cl. 73-607.000.
Horne, Thomas: *See—*
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Horstmann, Winfried: *See—*
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Hort, Eugene V.; and De Thomas, Waldo R., to GAF Corporation. Purification of pyrrolidone. 4,276,215, Cl. 260-326.5FN.
Houtman, Paul K.: *See—*
Woodring, Richard H.; Whitmore, Charles H.; Houtman, Paul K.; and Kowalski, Thomas A., 4,275,997, Cl. 417-218.000.
Hovel, Harold J.; and Woodall, Jerry M., to International Business Machines Corporation. Control of surface recombination loss in solar cells. 4,276,137, Cl. 204-164.000.
Hoveler, Egon: *See—*
Mohn, Hans-Werner; Buchholz, Rainer; Hoveler, Egon; and Zodrow, Rudolf, 4,275,807, Cl. 198-344.000.
Howarth, Michael S., to Imperial Chemical Industries Limited. Process for the purification of esters of phosphorus thioacids. 4,276,418, Cl. 544-243.000.
Howe, John G., to AMF Incorporated. Tennis racket. 4,275,885, Cl. 273-73.00C.
Howser, Muir G.: *See—*
Coots, James C.; and Howser, Muir G., 4,275,980, Cl. 414-411.000.
Hoxmeier, Ronald J., to Shell Oil Company. Supported molybdenum/tungsten compositions. 4,276,199, Cl. 252-438.000.
Huang, James P. H. Novel fuel composition and the process of preparing same. 4,276,055, Cl. 44-53.000.
Huang, Marshall Y., to TRW Inc. Wideband, phase compensated amplifier with negative feedback of distortion components in the output signal. 4,276,514, Cl. 330-149.000.
Huang, Shih C. Closure member. 4,275,759, Cl. 137-528.000.
Hubele, Adolf: *See—*
Kunz, Walter; Eckhardt, Wolfgang; and Hubele, Adolf, 4,276,303, Cl. 424-273.00R.
Hubert, Carl H., to RCA Corporation. Orientation of momentum stabilized vehicles. 4,275,861, Cl. 244-165.000.
Hue, Bernard P. H.; and Mercier, Henri A., to Pechiney Ugine Kuhlmann. Process for depositing alumina onto a substrate and alumina regeneration. 4,276,327, Cl. 427-345.000.
Huebner, Steven R.: *See—*
Mayers, Richard R.; Huebner, Steven R.; and Chojnacki, Dennis A., 4,275,569, Cl. 62-373.000.
Hueschen, Robert E.: *See—*
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Hug, Niklaus, to Rommag P. Worwag & Co. Removable dust collecting container for professional and household vacuum cleaners. 4,276,070, Cl. 55-429.000.
Hughes Aircraft Company: *See—*
Ahuja, Arjan D.; and Brewer, James E., 4,276,486, Cl. 307-252.00B.
Benedict, Douglas M.; and Gaskill, James R., Jr., 4,276,488, Cl. 307-272.00A.
Bilow, Norman; and Landis, Abraham L., 4,276,407, Cl. 528-172.000.
Crawford, Fred I., 4,276,474, Cl. 250-349.000.
Williams, Frederick C.; and Kummer, Wolfgang H., 4,276,551, Cl. 343-100.0SA.
Humme, Gert: *See—*
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Hummel, Erhard: *See—*
Lehmann, Gerhard; and Hummel, Erhard, 4,275,924, Cl. 297-362.000.
Humphrey, Verle L. Hinged bi-level hitch for a vehicle. 4,275,899, Cl. 280-491.00B.
Hundt, Dieter; Sedelmeyer, Marianne; Roschlau, Peter; Stahler, Fritz; and Gruber, Wolfgang, to Boehringer Mannheim GmbH. Creatine kinase control serum. 4,276,376, Cl. 435-17.000.
Hunt, Alexander C., to Huntal Manufacturing Company Incorporated. Quick connectable coupling. 4,275,907, Cl. 285-18.000.
Hunt, Guilbert M.: *See—*
Groth, Hugh F.; Hunt, Guilbert M.; and Shaner, Ronald E., 4,275,651, Cl. 100-229.00A.
Huntal Manufacturing Company Incorporated: *See—*
Hunt, Alexander C., 4,275,907, Cl. 285-18.000.
Husqvarna Aktiebolag: *See—*
Risman, Per O., 4,276,462, Cl. 219-10.55F.
Hussein, Hany M., to Becton, Dickinson and Company. Syringe with pressure-limited delivery. 4,275,730, Cl. 128-234.000.
Hutchison, Charles L. Sealing devices. 4,275,485, Cl. 24-30.50R.
Hutson, Thomas, Jr.; Makovec, Donald J.; and Beckworth, Alden E., to Phillips Petroleum Company. Catalytic alkylation method and apparatus with hydrocarbon recycle. 4,276,439, Cl. 585-720.000.
I.M.I. Industria Macchine Idrauliche S.p.A.: *See—*
Bazzea, Cesare, 4,276,013, Cl. 425-451.500.
Ichikawa, Matsuo, to Ichikawa Press Industries Co., Ltd. Automotive headlight. 4,276,584, Cl. 362-308.000.
Ichikawa Press Industries Co., Ltd.: *See—*
Ichikawa, Matsuo, 4,276,584, Cl. 362-308.000.
Ienaka, Masanori; Yamamura, Masahiro; Watanabe, Kazuo; and Kominami, Yasuo, to Hitachi, Ltd. Protective circuit. 4,276,442, Cl. 179-1.00A.
Ihara, Tomomi: *See—*
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Iinuma, Kazumoto, to Nippon Electric Co., Ltd. Code converting circuits. 4,276,544, Cl. 340-347.0DD.
Ikezaki, Muneyoshi; Noguchi, Katsuyuki; Iwai, Hajime; and Inamasu, Masanori, to Tanabe Seiyaku Co., Ltd. Novel benzylalcohol derivative and process for preparing the same. 4,276,304, Cl. 424-282.000.
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Imada, Kiyoshi: *See—*
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Imahori, Seiichi; Hihara, Toshio; Yomeyama, Tomio; and Hirota, Takao, to Mitsubishi Chemical Industries Limited. Anthraquinone reactive dyes for cellulose-containing fibers. 4,276,047, Cl. 8-532.000.
Imaizumi, Masaru, to Minolta Camera Kabushiki Kaisha. Electrophotographic copying apparatus. 4,275,876, Cl. 271-8.00R.
Imamura, Akio; Yamaga, Eiichi; and Nakada, Akira, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument with automatic arpeggio faculty. 4,275,634, Cl. 84-1.030.
Immuno Aktiengesellschaft fur chemisch-medizinische Produkte: *See—*
Eibl, Johann; and Aicher, Helmut, 4,276,259, Cl. 422-71.000.
Eibl, Martha; Schwarz, Otto; and Linnau, Yendra, 4,276,283, Cl. 424-85.000.
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Bramwell, Michael J., 4,276,346, Cl. 428-286.000.
Coffee, Ronald A., 4,275,846, Cl. 239-690.000.
Howarth, Michael S., 4,276,418, Cl. 544-243.000.
Porter, Kenneth, 4,276,106, Cl. 156-181.000.
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Independent Broadcasting Authority: *See—*
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Industrial Blast Coil Corporation: *See—*
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Industrie Pirelli S.p.A.: *See—*
Gessaga, Rinaldo, 4,276,105, Cl. 156-128.00N.
Ing. Waldhauser Maschinenfabrik Ges.m.b.H. & Co. KG: *See—*
Waldhauser, Kurt, 4,275,761, Cl. 137-595.000.
Ingersoll-Rand Company: *See—*
Schivley, George P., Jr.; and Madonna, Peter L., 4,275,793, Cl. 173-9.000.
Willett, Daniel E.; Boothroyd, John A.; and Langlais, William F., 4,276,459, Cl. 200-157.000.
Ingles, Norma: *See—*
Singer, William; Nowak, Milton; and Ingles, Norma, 4,276,211, Cl. 260-29.6MN.
Inoue, Haruhiko; and Nakano, Syuji, to Omron Tateisi Electronics Co. Electronic cash register including means for producing printed validation data. 4,276,598, Cl. 364-405.000.

Inoue, Mitsumasa: *See*—
Yoshikawa, Katsushi; Saito, Masaaki; Ota, Tadaki; and Inoue, Mitsumasa, 4,276,238, Cl. 261-39.00D.
Yoshikawa, Katsushi; Saito, Masaaki; Ota, Tadaki; and Inoue, Mitsumasa, 4,276,239, Cl. 261-44.00E.
Inoue, Sakae: *See*—
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Inoue, Tomohiro; Tanimoto, Akira; and Washizuka, Isamu, to Sharp Kabushiki Kaisha. Display control of hand-written, memorized pattern at a preselected time. 4,276,541, Cl. 340-146.3SY.
Institut Francais du Petrole: *See*—
Brun, Didier; Chrysostome, Gerard; Feugier, Alain; and Sale, Bernard, 4,276,266, Cl. 423-1.000.
Institute for Gravitational Strain Pathology, Inc.: *See*—
Jungmann, Martin, deceased, 4,275,718, Cl. 128-95.000.
Institute of Gas Technology: *See*—
Fejer, Andrew A., 4,275,562, Cl. 60-648.000.
International Business Machines Corporation: *See*—
Arzubi, Luis M.; Clemen, Rainer; and Gschwendtner, Jorg, 4,276,487, Cl. 307-270.000.
Baasch, Holger J.; and Luecke, Francis S., 4,276,574, Cl. 360-121.000.
Bakos, Peter; Bendz, Gerald A.; Darrow, Russell E.; and Rivenburgh, Dennis L., 4,276,186, Cl. 252-158.000.
Beilstein, Kenneth E., Jr.; and Kotecha, Harish N., 4,276,095, Cl. 148-1.500.
Bolcavage, Richard D.; Fleek, Arthur E.; and Marcus, Mitchell P., 4,275,653, Cl. 101-93.140.
Brereton, David A.; and Stansbury, Buddy F., 4,276,595, Cl. 364-200.000.
Brown, Byron R., 4,276,613, Cl. 365-14.000.
Habegger, Millard A.; and Hooker, Ross B., III, 4,275,960, Cl. 355-68.000.
Hovel, Harold J.; and Woodall, Jerry M., 4,276,137, Cl. 204-164.000.
Irwin, John W., 4,275,968, Cl. 400-582.000.
Vinal, Albert W., 4,276,555, Cl. 357-13.000.
International Co-op: *See*—
Andersen, Lowell J., 4,276,314, Cl. 426-272.000.
International Telephone and Telegraph Corporation: *See*—
Garmany, William J., 4,276,552, Cl. 343-105.00R.
O'Brien, Brian, Jr., 4,276,072, Cl. 65-3.00A.
Intradym Maschinen AG: *See*—
Egger, Hansruedi, 4,275,836, Cl. 239-124.000.
Intraspec Inc.: *See*—
Fleck, William C., 4,276,610, Cl. 364-900.000.
Inventio AG: *See*—
Geiger, Werner, 4,275,783, Cl. 164-146.000.
Ionics Inc.: *See*—
Jain, Surendar M., 4,276,140, Cl. 204-180.00P.
Iowa State University Research Foundation, Inc.: *See*—
Verkade, John G., 4,276,195, Cl. 252-431.00P.
Irio, Francis; and Chene, Richard, to Etablissement Caillau. Open type clamp. 4,275,484, Cl. 24-20.00F.
Irwin, John W., to International Business Machines Corporation. System for controlling and sequencing a printer. 4,275,968, Cl. 400-582.000.
Ishibashi, Tadashi: *See*—
Kohyama, Masaharu; and Ishibashi, Tadashi, 4,275,494, Cl. 29-592.00R.
Ishida, Masamitsu: *See*—
Kato, Hisatoyo; Ishida, Masamitsu; and Matsumoto, Seiji, 4,276,473, Cl. 250-327.100.
Ishihara, Eisuke; Yonehara, Hiroshi; Akasaki, Katsuyuki; Minowa, Masao; and Kobayashi, Katsumi, to Kumiai Chemical Industry Co., Ltd. Process for decreasing ammonia concentration in domestic animals or fowls. 4,276,286, Cl. 424-117.000.
Ishihara, Tadashi: *See*—
Mibu, Hiroaki; Ishihara, Tadashi; Tanaka, Chiaki; and Esaki, Shingo, 4,276,479, Cl. 250-492.00R.
Ishikawa, Kozo: *See*—
Hayashi, Yoshiro; Sugihara, Akira; Shimura, Takaki; Ishikawa, Kozo; Wada, Kiyoshi; Yamanaka, Eiji; and Senba, Shunsuke, 4,276,57[illegible] Cl. 360-12.000.
Ishikawa, Masao: *See*—
Orii, Shinichi; and Ishikawa, Masao, 4,276,581, Cl. 362-40.000.
Ishikawa, Masayuki; Tanaka, Hiromichi; Eguchi, Yukuo; Ito, Shigeru; Takashima, Yoshimi; and Kobayashi, Masahiko, to Ishikawa, Masayuki. 3-Aromatic moiety substituted-4(3H)-quinazolinones, process for production thereof, and use thereof. 4,276,295, Cl. 424-251.000.
Ishikawa, Youhei: *See*—
Nishikawa, Toshio; Tamura, Sadahiro; and Ishikawa, Youhei, 4,276,525, Cl. 333-206.000.
Issei, Katsuta, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for purification of crude olefinically unsaturated nitrile and condenser useful for same process. 4,276,125, Cl. 203-4.000.
IT Enviroscience, Inc.: *See*—
Miller, Richard A., 4,276,198 Cl. 252-438.000.
Ito, Masashi: *See*—
Obata, Shuichi; and Ito, Masashi, 4,276,635, Cl. 369-256.000.
Ito, Shigeru: *See*—
Ishikawa, Masayuki; Tanaka, Hiromichi; Eguchi, Yukuo; Ito, Shigeru; Takashima, Yoshimi; and Kobayashi, Masahiko, 4,276,295, Cl. 424-251.000.
Ito, Takaaki; and Watanabe, Tokio, to Sumitomo Chemical Company, Limited. Method for controlling wood-damaging insects. 4,276,308, Cl. 424-304.000.
Iwai, Hajime: *See*—
Ikezaki, Muneyoshi; Noguchi, Katsuyuki; Iwai, Hajime; and Inamasu, Masanori, 4,276,304, Cl. 424-282.000.
Iwami, Etsuji; and Saito, Takayuki, to Hitachi Chemical Company, Ltd. Molding resin composition. 4,276,388, Cl. 525-48.000.
Izumi Denki Corporation: *See*—
Fujita, Teizo; Ohashi, Toshiro; and Takimoto, Kouji, 4,276,631, Cl. 368-89.000.
J. G. Anschutz, GmbH: *See*—
Gerstenberger, Friedrich; Loos, Wolfgang; and Straub, Dieter, 4,275,521, Cl. 42-84.000.
J. K. Lasers Limited: *See*—
Burbeck, Ronald N.; and Keightley, Michael R., 4,276,497, Cl. 315-209.00R.
Jackisch, Philip F., to Ethyl Corporation. Stabilization of dibromostyrene. 4,276,189, Cl. 252-404.000.
Jackson, Philip, to Errut Products Limited. Planing apparatus with bridging cutters. 4,275,928, Cl. 299-39.000.
Jackson, Philip, to E. Beaudrey & Cie. Water filter having spiral casing. 4,276,171, Cl. 210-437.000.
Jagenberg-Werke AG: *See*—
Mohn, Hans-Werner; Buchholz, Rainer; Hoveler, Egon; and Zodrow, Rudolf, 4,275,807, Cl. 198-344.000.
Jain, Surendar M., to Ionics Inc. Electrodialysis apparatus and process for fractionating protein mixtures. 4,276,140, Cl. 204-180.00P.
Jakobs, Karlhans: *See*—
Hendricks, Udo-Winfried; and Jakobs, Karlhans, 4,276,046, Cl. 8-532.000.
Jamar, Dwight W., to Newcon Company. Operator for a gate valve. 4,275,866, Cl. 251-250.000.
James, Ralph E.: *See*—
Teetzel, Michael L.; and James, Ralph E., 4,275,529, Cl. 51-334.000.
Janiszewski, Michael: *See*—
Gelardi, Anthony; Gelardi, Paul; Swinburne, Stephen; Janiszewski, Michael; MacLeod, Robert, Jr.; Philippe, James; and Philippe, David, 4,275,943, Cl. 312-319.000.
Jansen, Harvey B.: *See*—
Hatch, Robert A.; Jansen, Harvey B.; Bolliger, Frederic E.; and Sumegi, Robert B., 4,275,558, Cl. 60-39.16R.
Jansen, Pierre G.; and Kessels, Jozef L. W., to U.S. Philips Corporation. Device for the control of data flows. 4,276,611, Cl. 364-900.000.
Japan Music Supply Inc.: *See*—
Takagi, Taketoshi, 4,275,947, Cl. 339-183.000.
Japan Storage Battery Co., Ltd.: *See*—
Mibu, Hiroaki; Ishihara, Tadashi; Tanaka, Chiaki; and Esaki, Shingo, 4,276,479, Cl. 250-492.00R.
Japanese National Railways: *See*—
Hayashi, Yoshiro; Sugihara, Akira; Shimura, Takaki; Ishikawa, Kozo; Wada, Kiyoshi; Yamanaka, Eiji; and Senba, Shunsuke, 4,276,572, Cl. 360-12.000.
Jarman, Hall E.: *See*—
Haesly, Barry F.; and Jarman, Hall E., 4,276,460, Cl. 200-292.000.
Jarvis, Clifford W.; and Pearson, John E., to Crime Fighter, Inc. Door activated burglar alarm utilizing time delay. 4,276,545, Cl. 340-545.000.
Jefferson, Robert T.: *See*—
Butler, Gordon K.; and Jefferson, Robert T., 4,275,889, Cl. 277-42.000.
Jensen, Thomas C.; and Lowe, Terry L., to Deere & Company. Shovel with soil directing structure. 4,275,792, Cl. 172-703.000.
Jersey Nuclear-Avco Isotopes, Inc.: *See*—
McAllister, Gary L., 4,276,517, Cl. 331-94.50P.
Jocham, Rudolf: *See*—
Ehrlinger, Friedrich; Mann, Egon; Fischer, Manfred; and Jocham, Rudolf, 4,275,616, Cl. 74-730.000.
Johansson, Jan O.; and Karlsson, Gosta, to Anderstorps Werkstads Aktiebolag. Pipe clamp structures. 4,275,489, Cl. 24-279.000.
John Fluke Mfg. Co., Inc.: *See*—
Johnston, Craig E.; and Goyal, Ramesh C., 4,276,513, Cl. 330-9.000.
John, Peter: *See*—
Lindner, Tassilo; Zeller, Norbert; Frey, Volker; Riedle, Rudolf; John, Peter; and Engelsberger, Georg, 4,276,426, Cl. 556-479.000.
John Zink Company: *See*—
Dinsmore, Harold L., 4,276,058, Cl. 55-48.000.
Johns Hopkins University, The: *See*—
Fischell, Robert E., 4,275,739, Cl. 128-419.0PS.
Johnson, Elwood O. Moisture proof matting. 4,276,342, Cl. 428-247.000.
Johnson, Grannis S.; and Rose, Ira M., to Diamond Shamrock Corporation. Pressure sensitive recording sheets. 4,275,906, Cl. 282-27.500.
Johnson, Joseph S.; and Stiles, Carl A., to Dayco Corporation. Mailbox and method of making same. 4,275,829, Cl. 232-17.000.
Johnson, Keith: *See*—
Haire, Darrell W., 4,275,501, Cl. 30-374.000.
Johnson, Marvin M.: *See*—
Wu, Yulin; Johnson, Marvin M.; and Nowack, Gerhard P., 4,276,200, Cl. 252-443.000.
Johnson, Raymond R. Scaffolding power attachment. 4,275,797, Cl. 180-2.00R.

Johnston, Craig E.; and Goyal, Ramesh C., to John Fluke Mfg. Co., Inc. Auto-zero amplifier circuit with wide dynamic range. 4,276,513, Cl. 330-9.000.

Joice, Richard L. Apparatus and method for individual bag working and stacking. 4,275,977, Cl. 414-51.000.

Jones, Howard; Clark, Robert L.; and Zimmerman, Morris, to Merck & Co., Inc. 2-Aryl-1,2-benzisothiazolinone-1,1-dioxides and their use as selective protease inhibitors. 4,276,298, Cl. 424-270.000.

Jones, Howard P., to Edo Western Corporation. Film processor apparatus. 4,275,959, Cl. 355-20.000.

Jones, Neal K. Method of and means for scanning images. 4,275,949, Cl. 350-6.300.

Jones, Raymond L. Drafting device for producing concentric lines. 4,275,502, Cl. 33-27.00L.

Jones, William H., to Eaton Corporation. Clothes dryer temperature control system. 4,275,508, Cl. 34-43.000.

Joppien, Hartmut: *See*—
Franke, Heinrich; and Joppien, Hartmut, 4,276,309, Cl. 424-322.000.

Joshi, David, to Colgate-Palmolive Company. Free flowing builder beads and detergents. 4,276,326, Cl. 427-220.000.

Joslin, Joel A.: *See*—
Satchell, Fred E.; and Joslin, Joel A., 4,276,250, Cl. 264-167.000.

Jost, Max, to Ciba-Geigy Corporation. Process for the coloration of organic material of high molecular weight in the melt within anthraquinone dyes. 4,276,213, Cl. 260-40.00R.

Juenemann, Werner; Lamm, Gunther; and Loeffler, Hermann, to BASF Aktiengesellschaft. Dyeing and printing of cellulosic textile material. 4,276,045, Cl. 8-471.000.

Juffa, Richard; and Boden, Heinrich, to Bayer Aktiengesellschaft. Apparatus for metering at least two reaction components into a mixing chamber. 4,275,822, Cl. 222-63.000.

Juglekar, Manohar A.: *See*—
Bench, Stephen M.; Dirkes, William R.; Juglekar, Manohar A.; Secora, James C.; and Stephen, Michael A., 4,276,651, Cl. 375-120.000.

Julien, Earl W. Gas torch. 4,276,017, Cl. 431-344.000.

Jundt, Werner; and Roozenbeek, Herman, to Robert Bosch GmbH. Ignition system for an internal combustion engine. 4,275,702, Cl. 123-610.000.

Jundt, Werner: *See*—
Bodig, Bernd; Roozenbeek, Herman; and Jundt, Werner, 4,275,703, Cl. 123-617.000.

Jungmann, Gertrude, heir: *See*—
Jungmann, Martin, deceased, 4,275,718, Cl. 128-95.000.

Jungmann, Martin, deceased (by Jungmann, Gertrude, heir), to Institute for Gravitational Strain Pathology, Inc. Pelvic device. 4,275,718, Cl. 128-95.000.

Juntgen, Harald: *See*—
Gappa, Gunther; Juntgen, Harald; and Klein, Jurgen, 4,276,178, Cl. 210-662.000.

Jureit, J. Calvin; Seipos, Andrew G.; and Langevin, William J., to Automated Building Components, Inc. Rolled nail strips packed without spools. 4,275,854, Cl. 242-55.000.

Juy, Henri, to Le Simplex. Saddle shank for bicycles and similar vehicles. 4,275,922, Cl. 297-195.000.

K-G Devices Corporation: *See*—
Goldsmith, Arthur C.; and Kirkgasser, James P., 4,275,630, Cl. 83-500.000.

K-Tron International Inc.: *See*—
Bullivant, Kenneth W.; and Schreier, Hermann, 4,275,808, Cl. 198-533.000.

Kabushiki Kaisha Asahi Gomu: *See*—
Tanaka, Kazuyoshi, 4,276,341, Cl. 428-246.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Satoh, Katsuhiko; Asano, Kazuhiro; Mandai, Masaaki; Ueda, Makoto; Torisawa, Akira; and Shida, Masaharu, 4,276,626, Cl. 368-80.000.

Kabushiki Kaisha Maruyama Seisakusho: *See*—
Shimizu, Yoichi, 4,275,772, Cl. 139-91.000.

Kabushiki Kaisha Murao Shoten: *See*—
Murao, Masami, 4,276,086, Cl. 75-134.00C.

Kabushiki Kaisha Takeda Sangyo: *See*—
Shimada, Koji; and Koike, Seiji, 4,276,347, Cl. 428-332.000.

Kabushikikaisha Ohkawara Seisakusho: *See*—
Takeyama, Toshiro; and Ohtani, Shigemori, 4,275,841, Cl. 239-431.000.

Kadota, Michio, to Murata Manufacturing Co., Ltd. Acoustic surface wave device. 4,276,524, Cl. 333-194.000.

Kaemmer, Eduard: *See*—
Schoettle, Klaus; Hoffmann, Werner; Kaemmer, Eduard; Boehlke, Klaus; and Lewin, Helmut, 4,276,575, Cl. 360-130.210.

Kageyama, Hiroshi; and Saito, Tsuyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Film containing magazine. 4,275,814, Cl. 206-455.000.

Kahn, Twassul A.; Kiowski, John W.; and Lang, Douglas G., to Geosource Inc. Method and apparatus for obtaining a composite field response to a variable source array using weighting coefficients. 4,276,620, Cl. 367-60.000.

Kaiser Aluminum & Chemical Corporation: *See*—
Cassens, Nicholas, Jr., 4,276,091, Cl. 106-58.000.
Schlager, Richard J.; and Murphy, James F., 4,276,272, Cl. 423-244.000.

Kalashnikov, Leonid F.; Kudiarov, Vladimir N.; Kushnir, Georgy M.; Shapiro, Anatoly S.; Konstantinov, Rjury I.; Nikolaev, Vadim V.; and Kunets, Vladimir K. Axial or worm-type centrifugal impeller pump. 4,275,988, Cl. 415-74.000.

Kali and Salz Aktiengesellschaft: *See*—
Singewald, Arno; Fricke, Gunter; Neitzel, Ulrich; and Geisler, Iring, 4,276,154, Cl. 209-3.000.

Kalns, Ilmars, to Eaton Corporation. Hydraulic system for a ratio change transmission. 4,275,617, Cl. 74-750.00R.

Kalocsay, Joseph, to Boeing Company, The. Indirectly heated aircraft probes and masts. 4,275,603, Cl. 73-861.680.

Kamihama, Kiyoshi, to Nissan Motor Company, Limited; and Hashimoto Forming Kogyo Company Limited. Wheel cover comprising two or more cover plates each having spoke-like portions inseparable from other portions. 4,275,930, Cl. 301-37.0SS.

Kamyr Aktiebolag: *See*—
Richter, Johan C. F. C.; and Richter, Ole J., 4,276,167, Cl. 210-331.000.

Kaneko, Kojiro: *See*—
Kuroda, Michio; Nakamura, Shozo; Tsukahara, Satoshi; Akatu, Yasuaki; Sugita, Shigehisa; Kaneko, Kojiro; Sakaguchi, Seiichiro; and Oshima, Ryoichiro, 4,275,563, Cl. 60-673.000.

Kanzaki, Nobuyoshi; Toyama, Kenji; Nakano, Katsutoshi; Shimatani, Ryoichi; and Kudo, Fumio, to Matsushita Electric Industrial Co., Ltd. Method for producing foil electrodes for electrolytic capacitor. 4,276,129, Cl. 204-58.000.

Kappler, Guenter; and Fehler, Adolf, to Motoren- und Turbinen Union Munchen GmbH. Combustion chamber for gas turbine engines. 4,275,564, Cl. 60-738.000.

Karamian, Narbik A. Method for preventing bacterial passage into sterile fluid systems. 4,276,256, Cl. 422-24.000.

Karayannis, Nicholas M.; Grams, Harold; and Skryantz, John S., to Standard Oil Company (Indiana). Catalyst and process for polymerization of alpha-olefins. 4,276,191, Cl. 252-429.00C.

Karim, Khalid A.; and Rea, James H., to Gulf Oil Corporation. Blends of ethylene-alkyl acrylate copolymers with rosin esters. 4,276,111, Cl. 156-308.200.

Karl, Rupert: *See*—
Blohm, Reinhard; Karl, Rupert; and Sarcander, Hans, 4,275,553, Cl. 57-263.000.

Karlsson, Gosta: *See*—
Johansson, Jan O.; and Karlsson, Gosta, 4,275,489, Cl. 24-279.000.

Karnis, Alkibiadis; and Shallhorn, Paul M., to Domtar Inc. Method and apparatus for on-line monitoring of specific surface of mechanical pulps. 4,276,119, Cl. 162-49.000.

Karnofsky, George B.; and Brink, Robert E., to Dravo Corporation. Method of recovering heat from hot granular solids. 4,276,021, Cl. 432-85.000.

Karrer, Friedrich, to Ciba-Geigy Corporation. N-Heterocyclic substituted acryloyl polymeric compounds. 4,276,401, Cl. 526-263.000.

Kasei Optonix, Ltd.: *See*—
Manabe, Toshikatsu; Nonogaki, Saburo; Morishita, Hajime; Uchino, Shoichi; Tomita, Yoshifumi; Nishizawa, Masahiro; Yokomizo, Hiroshi; and Ohmatoi, Susumu, 4,276,363, Cl. 430-28.000.

Kaser, Franz: *See*—
Broghammer, Rudolf; and Kaser, Franz, 4,276,625, Cl. 368-75.000.

Kashiwaba, Yukio: *See*—
Matsui, Katsuhiko; Kashiwaba, Yukio; and Kishimoto, Yoshioki, 4,276,161, Cl. 210-86.000.

Kashmerick, Gerald E., to Outboard Marine Corporation. Stern drive gear box and clutching arrangement. 4,276,034, Cl. 440-75.000.

Kato, Hisatoyo; Ishida, Masamitsu; and Matsumoto, Seiji, to Fuji Photo Film Co., Ltd. Gradation processing method and apparatus for radiation image recording system. 4,276,473, Cl. 250-327.100.

Kato, Shigeo: *See*—
Takano, Yukio; Ogirima, Masahiko; Aoki, Shigeru; Maki, Michiyoshi; and Kato, Shigeo, 4,276,114, Cl. 156-645.000.

Kato, Toshio: *See*—
Sakai, Katsuya; Mita, Ryuichi; Kato, Toshio; Higuchi, Chojiro; and Murakami, Hisamichi, 4,276,187, Cl. 252-186.000.

Kato, Yoshiaki, to Nissan Motor Company, Limited. Vehicle window glass washing system. 4,275,477, Cl. 15-250.020.

Kato, Yutaka: *See*—
Matsumura, Osamu; Kato, Yutaka; Sekiguchi, Tsunetoshi; and Namiki, Ryo, 4,276,629, Cl. 368-86.000.

Katz, David H., to Scripps Clinic & Research Foundation. Immunochemical conjugates: method and composition. 4,276,206, Cl. 260-6.000.

Katz, Otto, to A.W. Faber-Castell. Mechanical pencil. 4,275,971, Cl. 401-80.000.

Katz, Saul N.; and Gottesman, Martin, to General Foods Corporation. Method for decaffeinating coffee. 4,276,315, Cl. 426-428.000.

Kawaguchi, Toshio: *See*—
Okawa, Tadashi; Honbu, Mitsuyuki; Matsuda, Yasuo; Shibata, Takanori; and Kawaguchi, Toshio, 4,276,589, Cl. 363-71.000.

Kawai, Hisasi; Egami, Tsuneyuki; Kohama, Tokio; and Obayashi, Hideki, to Nippon Soken, Inc. Gas flow measuring apparatus. 4,275,590, Cl. 73-204.000.

Kay Elemetrics Corp.: *See*—
Harbeson, William D., 4,276,445, Cl. 179-1.0SC.

Kayama, Hiroyki: *See*—
Mouri, Takenori; Morimoto, Kengi; Yoshimoto, Itaru; Kayama, Hiroyki; Okazawa, Yukio; and Sizukuisi, Touru, 4,275,648, Cl. 99-483.000.

Kazama, Norio: *See*—
Okamoto, Shoji; and Kazama, Norio, 4,275,919, Cl. 296-214.000.

Keen, John M.; and Willoughby, Arthur F. W., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Fabrication of infra-red charge coupled devices. 4,276,099, Cl. 148-187.000.

Keeri-Szanto, Michael. Device for monitoring and controlling self-administered intravenous drug dosage. 4,275,727, Cl. 128-214.00E.

Kehler, James A.: *See*—
Holmes, Phillip R.; Kehler, James A.; and Bogusky, Ronald A., 4,275,572, Cl. 64-30.00D.

Keightley, Michael R.: *See*—
Burbeck, Ronald N.; and Keightley, Michael R., 4,276,497, Cl. 315-209.00R.

Keiper Automobiltechnik GmbH & Co. KG: *See*—
Holweg, Rainer; and Kluting, Bernd, 4,275,914, Cl. 296-65.00R.
Lehmann, Gerhard; and Hummel, Erhard, 4,275,924, Cl. 297-362.000.

Kell, Michael J.; and Mahoney, Robert D., to Cordis Dow Corp. Cellulose acetate hollow fiber and method for making same. 4,276,173, Cl. 210-500.200.

Keller Manufacturing Co., Inc.: *See*—
Keller, William A., 4,275,540, Cl. 52-314.000.

Keller, Walter: *See*—
Kutz, Johannes; Keller, Walter; Kruger, Max; and Kusters, Eduard, 4,275,683, Cl. 118-407.000.

Keller, William A., to Keller Manufacturing Co., Inc. Plastic free standing brick wall section. 4,275,540, Cl. 52-314.000.

Kempf, Jacques G. Method of recovering energy in the manufacture of polymers from monomeric gas and apparatus for carrying out the method. 4,276,398, Cl. 526-68.000.

Kendall Company, The: *See*—
Merry, Jack D., 4,275,728, Cl. 128-215.000.
Wichman, Cynthia A., 4,275,720, Cl. 128-132.00D.

Kennedy, Joseph P.; Smith, Robert A.; and Ross, Louis R., Jr., to University of Akron, The. Novel telechelic polymers, block copolymers and processes for the preparation thereof. 4,276,394, Cl. 525-245.000.

Kennedy, Robert W.: *See*—
Stewart, Richard F.; and Kennedy, Robert W., 4,276,241, Cl. 261-92.000.

Kennel, John M., to Rockwell International Corporation. Acceleration sensitive gyroscope stabilized platform. 4,275,605, Cl. 74-5.340.

Kenyon, Dennis, to Dunlop Limited. Resilient support means. 4,275,832, Cl. 238-310.000.

Kerivan, Leo J., to Industrial Blast Coil Corporation. Heat exchange tubing blade assembly. 4,275,785, Cl. 165-183.000.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Donnert, Dietfried; Eberle, Siegfried; and Endres, Gerhard, 4,276,160, Cl. 210-660.000.

Kerscher, Frederick C.; and Nowacki, John J., to Goodyear Tire & Rubber Company, The. Polymerization apparatus and process. 4,276,261, Cl. 422-131.000.

Kerwin, Kenneth H., II: *See*—
Nations, William N.; and Kerwin, Kenneth H., II, 4,276,654, Cl. 455-160.000.

Kessel, Bernhard. Trap-type drain with built-in strainer. 4,275,760, Cl. 137-546.000.

Kessels, Jozef L. W.: *See*—
Jansen, Pierre G.; and Kessels, Jozef L. W., 4,276,611, Cl. 364-900.000.

Kessler, James A.: *See*—
Hartford, Thomas W.; and Kessler, James A., 4,276,600, Cl. 364-431.000.

Ketcham & McDougall, Inc.: *See*—
Grunstad, Jerome A., 4,275,519, Cl. 40-378.000.

Keystone International, Inc.: *See*—
Schils, Petrus J. R., 4,275,867, Cl. 251-297.000.

Khanna, Ram-Tirth; and Turner, Robert L., to Du Pont de Nemours, E. I., and Company. High solids coating composition of a low molecular weight acrylic polymer and an alkylated melamine cross-linking agent. 4,276,212, Cl. 260-39.00R.

Kilbourn, Edward E.: *See*—
Weir, W. David; and Kilbourn, Edward E., 4,276,290, Cl. 424-200.000.

Killinger, Karl H., to Singer Company, The. Bobbin case with thread guide for cyclic sewing machine. 4,275,675, Cl. 112-229.000.

Kilpper, Gerhard; and Grimmer, Johannes, to BASF Aktiengesellschaft. Continuous preparation of anthranilic acid. 4,276,433, Cl. 562-458.000.

Kimblin, Clive W.; and Slade, Paul G., to Electric Power Research Institute, Inc. Vacuum envelope for current limiter. 4,276,455, Cl. 200-144.00B.

Kime, Wellesley R. Laser powered solid fuel disintegrator. 4,276,463, Cl. 219-121.0LB.

Kindell, Jerry L.: *See*—
Flynn, Richard T.; and Kindell, Jerry L., 4,276,596, Cl. 364-200.000.

Kindig, James K.; and Turner, Ronald L., to Hazen Research, Inc. Process for beneficiating ores. 4,276,081, Cl. 75-7.000.

King, Patrick D.; and Folk, Gary R., to Flo-Con Systems, Inc. Clamp-on tube holder and method. 4,275,825, Cl. 222-590.000.

Kingston, Douglas R.: *See*—
Appleton, Harold L.; and Kingston, Douglas R., 4,275,520, Cl. 40-605.000.

Kiowski, John W.: *See*—
Kahn, Twassul A.; Kiowski, John W.; and Lang, Douglas G., 4,276,620, Cl. 367-60.000.

Kirby, Charles E., to Procter & Gamble Company, The. Method of treating edible oil with alkali using interfacial surface mixer. 4,276,227, Cl. 260-425.000.

Kirchner, Gabriella: *See*—
Meszaros, Sandor; Kirchner, Gabriella; Balzer, Janos; and Wild, Karoly, 4,276,478, Cl. 250-468.000.

Kirk, John H., Jr., to Exxon Research & Engineering Co. Method and apparatus for producing a facsimile gray scale. 4,276,569, Cl. 358-298.000.

Kirk, Richard L.: *See*—
Baird, Roy W.; Berger, Robert E.; and Kirk, Richard L., 4,275,932, Cl. 301-39.00T.

Kirkgasser, James P.: *See*—
Goldsmith, Arthur C.; and Kirkgasser, James P., 4,275,630, Cl. 83-500.000.

Kirkpatrick, Craig G.: *See*—
Kohlenberger, Charles W.; Kirkpatrick, Craig G.; Estrada, John A.; and Chang, George Q., 4,275,599, Cl. 73-774.000.

Kishimoto, Yoshioki: *See*—
Matsui, Katsuhiko; Kashiwaba, Yukio; and Kishimoto, Yoshioki, 4,276,161, Cl. 210-86.000.

Kitai, Kiyoshi; Takazawa, Yuzuru; and Nagaoka, Shinji, to Seiko Koki Kabushiki Kaisha. Shutter release interrupting system. 4,275,955, Cl. 354-268.000.

Kitakohji, Toshisuke: *See*—
Yoneda, Yasuhiro; Kitakohji, Toshisuke; and Kitamura, Kenro, 4,276,365, Cl. 430-270.000.

Kitamura, Kenro: *See*—
Yoneda, Yasuhiro; Kitakohji, Toshisuke; and Kitamura, Kenro, 4,276,365, Cl. 430-270.000.

Kitamura, Masatsugu; Onoye, Hideo; and Yamazaki, Masami, to Victor Company of Japan, Limited. Automatic attenuation circuit. 4,276,604, Cl. 364-480.000.

Klaue, Manfred: *See*—
Siewert, Ingo; Klaue, Manfred; and Thietz, Peter, 4,276,109, Cl. 156-273.000.

Klauke, Erich: *See*—
Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; Krehan, Ingomar; Kraus, Peter; and Stendel, Wilhelm, 4,276,310, Cl. 424-322.000.

Kleesattel, Claus. Method and apparatus for the measurement of hardness testing indentations. 4,275,966, Cl. 356-378.000.

Klein, Hans J.: *See*—
Pohler, Friedmar; Falk, Hans; Muller, Josef; Klein, Hans J.; and Hoffacker, Franz, 4,276,324, Cl. 427-10.000.

Klein, Jurgen: *See*—
Gappa, Gunther; Juntgen, Harald; and Klein, Jurgen, 4,276,178, Cl. 210-662.000.

Kleine, Werner, to Gebruder Heller Verwaltungsgesellschaft mit beschrankter Haftung. Rock drilling tool. 4,275,796, Cl. 175-385.000.

Kleinewefers GmbH: *See*—
Schiffer, Gunter, 4,275,575, Cl. 68-5.00E.

Kline, Kenneth H.; and Kramer, Walter W., to Fuller Company. Fluid bed nozzle retainer. 4,275,509, Cl. 34-57.00R.

Klunsch, Max: *See*—
Erbach, Emil-Richard; Klunsch, Max; Lindner, Gerhard; and Lingens, Paul, 4,275,967, Cl. 366-149.000.

Kluting, Bernd: *See*—
Holweg, Rainer; and Kluting, Bernd, 4,275,914, Cl. 296-65.00R.

Knapp, Alan G.: *See*—
Stone, Henry D.; Knapp, Alan G.; Mansell, John R.; Overall, Colin D.; and Washington, Derek, 4,276,127, Cl. 204-24.000.

Knapstein, Bruno; and Vial, Friedrich, to Kronos Titan G.m.b.H. Plate-type paint grinding machine and its use in pigment testing. 4,275,850, Cl. 241-57.000.

Knoll, Francis. Apparatus and method for patterning geometric objects. 4,275,506, Cl. 33-175.000.

Knowles, James G., to Clayton Dewandre & Co. Ltd. Hydraulic control systems. 4,275,643, Cl. 91-444.000.

Knox, Lloyd C.; and Sullaway, Bob L., to Halliburton Company. Inflation and grout system. 4,275,974, Cl. 405-225.000.

Koa Denshi Kogyo Kabushiki Kaisha: *See*—
Hiruma, Hideo; and Maruhashi, Yukio, 4,276,621, Cl. 367-97.000.

Kobayashi, Katsumi: *See*—
Ishihara, Eisuke; Yonehara, Hiroshi; Akasaki, Katsuyuki; Minowa, Masao; and Kobayashi, Katsumi, 4,276,286, Cl. 424-117.000.

Kobayashi, Masahiko: *See*—
Ishikawa, Masayuki; Tanaka, Hiromichi; Eguchi, Yukuo; Ito, Shigeru; Takashima, Yoshimi; and Kobayashi, Masahiko, 4,276,295, Cl. 424-251.000.

Kobayashi, Yoshiaki, to Yamaha Hatsudoki Kabushiki Kaisha. Duct systems for water jet propulsion boats. 4,276,035, Cl. 440-47.000.

Koch Engineering Company, Inc.: *See*—
Chen, Gilbert K.; Nyberg, Paul M.; and Buchholz, Matthew, 4,276,242, Cl. 261-111.000.

Koch, Johannes: *See—*
Steinbrecher, Heinrich; Koch, Johannes; and Peglan, Manfred, 4,275,578, Cl. 72-14.000.

Koehler Manufacturing Company: *See—*
Sundberg, Erik, 4,276,359, Cl. 429-140.000.

Koehler, William M.: *See—*
Atwood, John E.; Baugh, John L.; Koehler, William M.; and Waterman, David K., 4,275,592, Cl. 73-432.00R.

Koerwer, John F., to Union Carbide Corporation. Phenoxy-phenoxyalkane carboxylic acids and derivatives as sugar enhancers for plants. 4,276,080, Cl. 71-108.000.

Kohama, Tokio: *See—*
Kawai, Hisasi; Egami, Tsuneyuki; Kohama, Tokio; and Obayashi, Hideki, 4,275,590, Cl. 73-204.000.

Kohlenberger, Charles W.; Kirkpatrick, Craig G.; Estrada, John A.; and Chang, George Q., to Rockwell International Corporation. Sensor for measuring dynamic variations in strain. 4,275,599, Cl. 73-774.000.

Kohlenberger, Raymond W. Extractor head for cleaning soft surfaces such as carpet or upholstry. 4,275,478, Cl. 15-401.000.

Kohyama, Masaharu; and Ishibashi, Tadashi, to Hitachi, Ltd. Method for manufacturing liquid crystal display elements. 4,275,494, Cl. 29-592.00R.

Koike, Seiji: *See—*
Shimada, Koji; and Koike, Seiji, 4,276,347, Cl. 428-332.000.

Koizumi, Akio, to Sony Corporation. DC to DC Converter. 4,276,587, Cl. 363-26.000.

Koizumi, Jun: *See—*
Sato, Yasuhiko; Koizumi, Jun; and Tokushige, Yuji, 4,276,135, Cl. 204-159.130.

Kojima, Shinichi: *See—*
Watanabe, Yasuaki; Okabe, Yukio; Kojima, Shinichi; and Sato, Mitsuya, 4,276,560, Cl. 358-28.000.

Kolaska, Johannes; and Grewe, Hans, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Method for producing hard metal bodies of increased wear resistance. 4,276,096, Cl. 148-16.600.

Koleske, Joseph V.; Smith, Oliver W.; France, Haywood G.; and Taller, Robert A., to Union Carbide Corporation. Low-energy-curable coatings compositions. 4,276,405, Cl. 528-58.000.

Kominami, Yasuo: *See—*
Ienaka, Masanori; Yamamura, Masahiro; Watanabe, Kazuo; and Kominami, Yasuo, 4,276,442, Cl. 179-1.00A.

Komiyama, Katsuhiko, to Citizen Watch Company Limited. Module structure for electronic digital timepiece. 4,276,627, Cl. 368-84.000.

Kondo, Osamu: *See—*
Yamashita, Mitsuo; and Kondo, Osamu, 4,275,879, Cl. 271-259.000.

Kondo, Yasuo: *See—*
Nishida, Yasuhiro; and Kondo, Yasuo, 4,276,036, Cl. 440-89.000.

Kondo, Yoshinobu: *See—*
Matsuoka, Hideoki; and Kondo, Yoshinobu, 4,275,903, Cl. 280-803.000.

Konig, Hans J.: *See—*
Blumrich, Walter; Dorr, Karl H.; Konig, Hans J.; and Sander, Ulrich, 4,276,116, Cl. 159-47.00R.

Konno, Akihiko: *See—*
Obara, Sanshiro; Tokuda, Hiroatsu; Konno, Akihiko; and Nakamura, Hideo, 4,276,602, Cl. 364-431.000.

Konstantinov, Rjury I.: *See—*
Kalashnikov, Leonid F.; Kudiarov, Vladimir N.; Kushnir, Georgy M.; Shapiro, Anatoly S.; Konstantinov, Rjury I.; Nikolaev, Vadim V.; and Kunets, Vladimir K., 4,275,988, Cl. 415-74.000.

Koontz, Harry S.: *See—*
Bryant, Lovell D.; and Koontz, Harry S., 4,276,509, Cl. 324-51.000.

Kopp, Hanspeter, to Zahnradfabrik Friedrichshafen AG. Hydraulic servo cylinder and piston. 4,275,641, Cl. 91-400.000.

Koppers Company, Inc.: *See—*
Emery, William G., 4,276,123, Cl. 202-241.000.
Rogers, Robert C., 4,276,121, Cl. 202-227.000.

Korhonen, Kaarlo J. Device for handling of meat and cutting-up thereof. 4,275,479, Cl. 17-1.00R.

Koritnik, Michael. Vehicle closure. 4,275,915, Cl. 296-76.000.

Kornfeld, Edmund C.: *See—*
Bach, Nicholas J.; and Kornfeld, Edmund C., 4,276,300, Cl. 424-273.00P.

Kotas, John A., to Desa Industries, Inc. Log splitter. 4,275,778, Cl. 144-193.00A.

Kotecha, Harish N.: *See—*
Beilstein, Kenneth E., Jr.; and Kotecha, Harish N., 4,276,095, Cl. 148-1.500.

Kothmann, Richard E.; and Cyphers, Joseph A., to Westinghouse Electric Corp. Fuel cell system configurations. 4,276,355, Cl. 429-26.000.

Kountz, Kenneth J.; and Norbeck, Dean K., to Borg-Warner Corporation. Adjustable surge and capacity control system. 4,275,987, Cl. 415-17.000.

Kowalski, Thomas A.: *See—*
Woodring, Richard H.; Whitmore, Charles H.; Houtman, Paul K.; and Kowalski, Thomas A., 4,275,997, Cl. 417-218.000.

Kozak, Andrei A.: *See—*
Stakhov, Alexei P.; Solyanichenko, Nikolai A.; Luzheisky, Vladimir A.; Ovodenko, Alexandr V.; and Kozak, Andrei A., 4,276,608, Cl. 364-768.000.

Kraemer, Erich H.; and Rolfs, John C., to Sperry Corporation. Integrated circuit planar high frequency mixer. 4,276,655, Cl. 455-327.000.

Kraft, Derald H., to Dyneer Corporation. Hydraulic belt tensioner construction. 4,276,038, Cl. 474-110.000.

Kraftwerk Union Aktiengesellschaft: *See—*
Engl, Gunter, 4,275,598, Cl. 73-622.000.

Kramer, Walter; and Follmann, Rainer, to Effem GmbH. Animal litter. 4,275,684, Cl. 119-1.000.

Kramer, Walter W.: *See—*
Kline, Kenneth H.; and Kramer, Walter W., 4,275,509, Cl. 34-57.00R.

Krantz, Leonard A.; and Hogan, Edward P., to Bendix Corporation, The. Filter connector with compound filter elements. 4,275,945, Cl. 339-147.00R.

Krass, Alvin. Motor skills tester. 4,276,546, Cl. 340-576.000.

Kraus, Charles E., to Excelermatic Inc. Infinitely variable traction roller transmission. 4,275,610, Cl. 74-200.000.

Kraus, Peter: *See—*
Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; Krehan, Ingomar; Kraus, Peter; and Stendel, Wilhelm, 4,276,310, Cl. 424-322.000.

Krause, Hans-Joachim: *See—*
Petersen, Harro; Krause, Hans-Joachim; Fischer, Kurt; Segnitz, Adolph; and Zaunbrecher, Horst, 4,276,209, Cl. 260-28.00P.

Krautkramer-Branson, Inc.: *See—*
Primbsch, Erik, 4,275,963, Cl. 356-35.500.

Krehan, Ingomar: *See—*
Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; Krehan, Ingomar; Kraus, Peter; and Stendel, Wilhelm, 4,276,310, Cl. 424-322.000.

Kreis, Gerhard; and Wegehaupt, Karl-Heinrich, to Wacker-Chemie GmbH. Addition of Si-bonded hydrogen to an aliphatic multiple bond. 4,276,252, Cl. 264-222.000.

Krekeler, Claude B., to Cincinnati Mine Machinery Company, The. Means for removably affixing a cutter bit mounting lug to a base member on the driven element of a mining machine or the like. 4,275,929, Cl. 299-91.000.

Kretschmar, Herbert C.: *See—*
Reller, Herbert H.; and Kretschmar, Herbert C., 4,276,430, Cl. 560-66.000.

Kreuz, Ulrich H.; and Wendel, Kurz H. Cutting tool. 4,275,853, Cl. 241-294.000.

Kronos Titan G.m.b.H.: *See—*
Knapstein, Bruno; and Vial, Friedrich, 4,275,850, Cl. 241-57.000.

Krovina, Peter G. Sailing system. 4,276,033, Cl. 440-8.000.

Kruger, Max: *See—*
Kutz, Johannes; Keller, Walter; Kruger, Max; and Kusters, Eduard, 4,275,683, Cl. 118-407.000.

Krupa, Joseph F.: *See—*
McIsaac, Lyle D.; Krupa, Joseph F.; and Schroeder, Norman C., 4,276,235, Cl. 260-990.000.

Kruschel, William A., to Minnesota Mining and Manufacturing Company. Crimping tool. 4,275,584, Cl. 72-410.000.

Kubota Ltd.: *See—*
Yoshizawa, Tadao; and Sakaguchi, Masayuki, 4,275,909, Cl. 285-110.000.

Kubota, Yuzuru: *See—*
Nagase, Hiroshi; Okuyama, Toshiaki; and Kubota, Yuzuru, 4,276,504, Cl. 318-721.000.

Kudiarov, Vladimir N.: *See—*
Kalashnikov, Leonid F.; Kudiarov, Vladimir N.; Kushnir, Georgy M.; Shapiro, Anatoly S.; Konstantinov, Rjury I.; Nikolaev, Vadim V.; and Kunets, Vladimir K., 4,275,988, Cl. 415-74.000.

Kudo, Fumio: *See—*
Kanzaki, Nobuyoshi; Toyama, Kenji; Nakano, Katsutoshi; Shimatani, Ryoichi; and Kudo, Fumio, 4,276,129, Cl. 204-58.000.

Kuehnle, Manfred R.; and Perry, George J., to Coulter Systems Corporation. Offset plate image transfer attachment for graphic art cameras. 4,275,957, Cl. 355-10.000.

Kues, Joachim: *See—*
Bahr, Albert; and Kues, Joachim, 4,275,847, Cl. 241-20.000.

Kuhnel, Donald S., to Graphic Arts Manufacturing Company. Analog read-only memory system for antilog conversion. 4,276,615, Cl. 365-45.000.

Kumai, Teruo: *See—*
Yoshida, Toshiro; and Kumai, Teruo, 4,275,696, Cl. 123-519.000.

Kumiai Chemical Industry Co., Ltd.: *See—*
Ishihara, Eisuke; Yonehara, Hiroshi; Akasaki, Katsuyuki; Minowa, Masao; and Kobayashi, Katsumi, 4,276,286, Cl. 424-117.000.

Kummer, Wolfgang H.: *See—*
Williams, Frederick C.; and Kummer, Wolfgang H., 4,276,551, Cl. 343-100.0SA.

Kundo - Kieninger + Obergfell: *See—*
Broghammer, Rudolf; and Kaser, Franz, 4,276,625, Cl. 368-75.000.

Kunets, Vladimir K.: *See—*
Kalashnikov, Leonid F.; Kudiarov, Vladimir N.; Kushnir, Georgy M.; Shapiro, Anatoly S.; Konstantinov, Rjury I.; Nikolaev, Vadim V.; and Kunets, Vladimir K., 4,275,988, Cl. 415-74.000.

Kunz, Walter; Eckhardt, Wolfgang; and Hubele, Adolf, to Ciba-Geigy Corporation. Microbicidal compositions. 4,276,303, Cl. 424-273.00R.

Kunze, Claus: *See—*
Meyer, Juergen; Schaaf, Norbert; and Kunze, Claus, 4,276,534, Cl. 338-15.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Hisazumi, Nobuyuki; Yamamoto, Masataka; and Uehara, Tsutomu, 4,275,544, Cl. 53-433.000.

Kuroda, Michio; Nakamura, Shozo; Tsukahara, Satoshi; Akatu, Yasuaki; Sugita, Shigehisa; Kaneko, Kojiro; Sakaguchi, Seiichiro;

and Oshima, Ryoichiro, to Hitachi, Ltd. Power-generating plant having increased circulating force of working fluid. 4,275,563, Cl. 60-673.000.

Kushnir, Georgy M.: *See*—
Kalashnikov, Leonid F.; Kudiarov, Vladimir N.; Kushnir, Georgy M.; Shapiro, Anatoly S.; Konstantinov, Rjury I.; Nikolaev, Vadim V.; and Kunets, Vladimir K., 4,275,988, Cl. 415-74.000.

Kusters, Eduard: *See*—
Kutz, Johannes; Keller, Walter; Kruger, Max; and Kusters, Eduard, 4,275,683, Cl. 118-407.000.

Kutz, Johannes; Keller, Walter; Kruger, Max; and Kusters, Eduard, to Kusters, Eduard. Apparatus for applying foam to a moving web. 4,275,683, Cl. 118-407.000.

La Cellophane: *See*—
de Leiris, Jean-Pierre, 4,276,340, Cl. 428-166.000.

Labaquere, Herve: *See*—
Cordier, Michel; Labaquere, Herve; and Saint-Dizier, Gilbert, 4,276,181, Cl. 210-741.000.

LaBelle, Charles: *See*—
Hetzel, Thomas R.; and LaBelle, Charles, 4,275,999, Cl. 417-299.000.

Laborde, Alice L.: *See*—
Dolak, Lester A.; Laborde, Alice L.; and Castle, Thomas M., 4,276,412, Cl. 536-17.00R.

Lackey, Walter J.; Lowrie, Robert S.; and Sease, John D., to United States of America, Energy. Gas scrubbing liquids. 4,276,063, Cl. 55-84.000.

LaConti, Anthony B.: *See*—
Coker, Thomas G.; and LaConti, Anthony B., 4,276,146, Cl. 204-266.000.

Lafarge Consultants Ltd.: *See*—
St. John, Charles F.; and Mercier, Gil A., 4,276,092, Cl. 106-100.000.

Lager, Jean-Paul; and Vautherin, Daniel A., to Le Material Telephonique. Receiver for simultaneously transmitted clock and auxiliary signals. 4,276,645, Cl. 371-36.000.

Lager, Jean-Paul: *See*—
Nguyen, Hieu K.; Dieudonne, Marc P. G.; and Lager, Jean-Paul, 4,276,641, Cl. 370-99.000.

Lambert Corporation: *See*—
Groth, Hugh F.; Hunt, Guilbert M.; and Shaner, Ronald E., 4,275,651, Cl. 100-229.00A.

Lambert, Gary M.: *See*—
Carlsen, W. John; Dakss, Mark L.; and Lambert, Gary M., 4,276,113, Cl. 156-502.000.

Lamberty, Reinhold: *See*—
Dahm, Franz-Ludwig; Diehl, Herbert; Eiermann, Kurt; Lamberty, Reinhold; and Nischk, Wolfgang, 4,276,143, Cl. 204-195.00M.

Lamm, Gunther: *See*—
Juenemann, Werner; Lamm, Gunther; and Loeffler, Hermann, 4,276,045, Cl. 8-471.000.

Lancini, Giancarlo: *See*—
Parenti, Francesco; Coronelli, Carolina; Tamoni, Giorgio; and Lancini, Giancarlo, 4,276,382, Cl. 435-253.000.

Landis, Abraham L.: *See*—
Bilow, Norman; and Landis, Abraham L., 4,276,407, Cl. 528-172.000.

Landis, Donald G.: *See*—
Beck, Martin A.; Fabricius, John H.; and Landis, Donald G., 4,276,603, Cl. 364-477.000.

Landstingens Inkopscentral Lic, Ekonomisk Forening: *See*—
Olson, Karin S. B., 4,275,721, Cl. 128-133.000.

Lane, Ronald S. Permanent calendar construction. 4,275,516, Cl. 40-107.000.

Lang, Douglas G.: *See*—
Kahn, Twassul A.; Kiowski, John W.; and Lang, Douglas G., 4,276,620, Cl. 367-60.000.

Lang, Gusztav: *See*—
Herb, Armin; and Lang, Gusztav, 4,275,637, Cl. 411-78.000.

Langevin, William J.: *See*—
Jureit, J. Calvin; Seipos, Andrew G.; and Langevin, William J., 4,275,854, Cl. 242-55.000.

Langlais, William F.: *See*—
Willett, Daniel E.; Boothroyd. John A.; and Langlais, William F., 4,276,459, Cl. 200-157.000.

Langley, Kenneth R.; and Fuller, John R. D., to Rolls-Royce Limited. Disc channel for cooling rotor blade roots. 4,275,990, Cl. 416-95.000.

Lanno, Joseph P.; and Finnemore, Fred M. Drive system and fluid dispenser unit utilizing same. 4,275,821, Cl. 222-61.000.

Lantzsch, Reinhard, to Bayer Aktiengesellschaft. Preparation of dihalogenovinyl-γ-butyrolactones. 4,276,218, Cl. 260-343.600.

Lantzsch, Reinhard; and Hoffmann, Hellmut, to Bayer Aktiengesellschaft. Decarbalkoxylation of carboxylic acid esters. 4,276,225, Cl. 260-408.000.

Laprie, Jean-Claude; Powell, David R.; Alcouffe, Gerard; and Romand, Paul, to Agence Nationale de Valorisation de la Recherche (ANVAR); and Societe Crouzet. Method of and means for routing binary messages through a multinode data-transmission system. 4,276,643, Cl. 371-8.000.

Largeteau, Pierre A., to Societe Anonyme Automobiles Citroen; and Automobiles Peugeot. Grinding heads for grinding machines. 4,275,530, Cl. 51-355.000.

Laughlin, William C.: *See*—
Tolley, William K.; Laughlin, William C.; and Rostoker, William, 4,276,083, Cl. 75-82.000.

Laussermair, Friedrich; and Willeitner, Eberhard, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Swirl chamber apparatus. 4,276,068, Cl. 55-348.000.

Lavigne, Ronald L.: *See*—
Martone, Leonard P.; and Lavigne, Ronald L., 4,276,164, Cl. 210-170.000.

Lawrence, Charles E.: *See*—
Halpern, Peter H.; and Lawrence, Charles E., 4,276,573, Cl. 360-45.000.

Lawrence, Dan D.; and Felber, Betty J., to Standard Oil Company (Indiana). Silicate activated lignosulfonate gel treatments of conductive zones. 4,275,789, Cl. 166-294.000.

Lawson, Rommon L. Process for magnetic separation and collection of viable female and male spermatozoa. 4,276,139, Cl. 204-180.00R.

LBF Properties, Inc.: *See*—
Bruhn, Larry C., 4,275,981, Cl. 414-462.000.

Le, Hiep T., to Raytheon Company. Transistor switching circuitry. 4,276,617, Cl. 365-189.000.

Le Material Telephonique: *See*—
Lager, Jean-Paul; and Vautherin, Daniel A., 4,276,645, Cl. 371-36.000.
Nguyen, Hieu K.; Dieudonne, Marc P. G.; and Lager, Jean-Paul, 4,276,641, Cl. 370-99.000.

Le Simplex: *See*—
Juy, Henri, 4,275,922, Cl. 297-195.000.

Leaback, David H., to Dynatech AG. Miniature reaction container and a method and apparatus for introducing micro volumes of liquid to such a container. 4,276,048, Cl. 23-230.00R.

LeBlond, J. Paul, to Small, J. W. Personal repellent device. 4,275,820, Cl. 222-3.000.

Le Bras, Andre: *See*—
Aguinet, Gerard; Le Bras, Andre; Manoury, Jean; and Martin, Edouard, 4,276,277, Cl. 423-393.000.

Leckie, William H. Fuel injection timing and control apparatus. 4,275,693, Cl. 123-447.000.

Le Dieu, Bernard, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Time-division switching network and means of mitigating the effect of fault conditions. 4,276,637, Cl. 370-16.000.

Lee, Arley G., to Schlumberger Technology Corporation. Apparatus for selectively coupling cables to well tools. 4,275,786, Cl. 166-65.00R.

Lee, Ernest O.: *See*—
Beetz, Otto W.; Lee, Ernest O.; Subrin, Richard I.; Brightman, Barrie; and Hanson, George C., 4,276,451, Cl. 179-175.20C.

Lee, Young-Jin, to Union Carbide Corporation. Process for preparing carbamate compounds. 4,276,229, Cl. 260-453.0RW.

Lehman, Donald F., to Black Clawson Company, The. Apparatus for screening paper fiber stock. 4,276,159, Cl. 209-273.000.

Lehmann, Gerhard; and Hummel, Erhard, to Keiper Automobiltechnik GmbH & Co. KG. Hinge mount having a wobble gear adjuster for a tiltable seat back of a motor vehicle seat. 4,275,924, Cl. 297-362.000.

Lehrkind, Nancy Northup: *See*—
Northup, John D., 4,276,073, Cl. 65-77.000.

Leifeld, Ferdinard, to Trutzschler GmbH & Co. KG. Arrangement for forming a sliver from a card web. 4,275,482, Cl. 19-150.000.

Leighton, Stephen B.; Murano, Genesio; Markowitz, Allen; and Chikadel, Burt, to United States of America, Health, Education & Welfare. Clot lysing timer. 4,276,383, Cl. 435-291.000.

Lemmond, Charles Q., to General Electric Company. Electron beam matrix deflector and method of fabrication. 4,276,335, Cl. 428-131.000.

Lenertz, John B., to Farmhand, Inc. Parking stand. 4,275,984, Cl. 414-686.000.

Leone, Ronald E., to Eastman Kodak Company. Acylhydrazinophenylthiourea nucleating agents and photographic emulsions and elements containing such agents. 4,276,364, Cl. 430-212.000.

Lergier, William: *See*—
Gillessen, Dieter; and Lergier, William, 4,276,049, Cl. 23-230.00B.

Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., to Sterling Drug Inc. Compositions and their preparation. 4,276,293, Cl. 424-248.400.

Lessard, Roy W. Pants rack. 4,275,826, Cl. 223-96.000.

Lester, David; and Alexander, Robert, to Polymerics, Inc. Pigment agglomerate coloring system. 4,276,207, Cl. 260-17.00R.

Lever Brothers Company: *See*—
Padley, Frederick B.; Paulussen, Cornelis N.; Soeters, Cornelis; and Tresser, David, 4,276,322, Cl. 426-660.000.

Levinson, Lionel M.; Ellis, Howard F.; and Fishman, Herbert, to General Electric Company. Arrester with graded capacitance varistors. 4,276,578, Cl. 361-127.000.

Levinstein, Hyman J.; Murarka, Shyam P.; and Sinha, Ashok K., to Bell Telephone Laboratories, Incorporated. Integrated semiconductor circuit structure and method for making it. 4,276,557, Cl. 357-67.000.

Lewin, Helmut: *See*—
Schoettle, Klaus; Hoffmann, Werner; Kaemmer, Eduard; Boehlke, Klaus; and Lewin, Helmut, 4,276,575, Cl. 360-130.210.

Lewis, Roger N.: *See*—
Muenchow, John R.; Pastorino, Ronald L.; Halle, Reidar; and Lewis, Roger N., 4,276,247, Cl. 264-54.000.

Lewis, Sidney E. Spinal positioning couch. 4,275,714, Cl. 128-74.000.

Li, Jorge P.: *See*—
Becker, Frank C.; and Li, Jorge P., 4,276,090, Cl. 106-18.320.

Lichte, Leo J.: *See*—
Fettel, Bruce E.; Morris, Paul E.; and Lichte, Leo J., 4,276,132, Cl. 204-129.100.

Lichti, Robert D.; and Hock, Frederick D., to Park Mobile, Inc., a part interest. Conveyor pan immobilizing assembly. 4,275,979, Cl. 414-251.000.

Lightning Location and Protection, Inc.: *See*—
Uman, Martin A.; and Standler, Ronald B., 4,276,576, Cl. 361-1.000.

Lindbom, Torsten H.: *See*—
Engelberger, Joseph F.; Lindbom, Torsten H.; Dunne, Maurice J.; Perzley, William; Roberts, Wilbur N.; and Gardner, Horace L., 4,275,986, Cl. 414-730.000.

Linde Aktiengesellschaft: *See*—
Becker, Hans; Grimm, Peter; Ranke, Gerhard; and Roth, Dieter, 4,276,057, Cl. 55-40.000.

Lindman, Karl A., to Flymo Societe Anonyme. Induction air cleaner for a lawn mower engine. 4,276,067, Cl. 55-337.000.

Lindner, Gerhard: *See*—
Erbach, Emil-Richard; Klunsch, Max; Lindner, Gerhard; and Lingens, Paul, 4,275,967, Cl. 366-149.000.

Lindner, Tassilo; Zeller, Norbert; Frey, Volker; Riedle, Rudolf; John, Peter; and Engelsberger, Georg, to Wacker-Chemie GmbH. Process for the preparation of organosilicon compounds. 4,276,426, Cl. 556-479.000.

Lingens, Paul: *See*—
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Linnau, Yendra: *See*—
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Lipinski, Christopher A., to Pfizer Inc. Pyridylaminotriazole therapeutic agents. 4,276,297, Cl. 424-263.000.

Lipper, Karl-August: *See*—
Bockmann, Walter; Lipper, Karl-August; and Bruhne, Friedrich, 4,276,231, Cl. 260-544.00D.

Lisega Kraftwerkstecknik GmbH & Co. KG: *See*—
de Groot, Fredrik W.; and Bernert, Jorg D., 4,275,802, Cl. 188-134.000.

Little, Hercel A., to Chore-Time Equipment, Inc. Motor control circuit. 4,276,506, Cl. 318-806.000.

Little, John S.: *See*—
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Littlehorn, John J., Jr. Apparatus for producing leaded glass articles. 4,275,633, Cl. 83-886.000.

Litvinenko, Leonid A.: *See*—
Redikultsev, Jury V.; Shkidchenko, Alexandr N.; Gorbunov, Oleg P.; and Litvinenko, Leonid A., 4,276,264, Cl. 422-307.000.

Llama Gabilondo y. Cia. S.A.: *See*—
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Lock Light Corporation: *See*—
Burnett, John, 4,276,582, Cl. 362-116.000.

Lockformer Company, The: *See*—
Anderson, Ronald A., 4,275,707, Cl. 126-318.000.

Lockwood, Francis R.; and Meuse, Kenneth P. Wick device. 4,276,016, Cl. 431-323.000.

Loeffler, Hermann: *See*—
Juenemann, Werner; Lamm, Gunther; and Loeffler, Hermann, 4,276,045, Cl. 8-471.000.

Loev, Bernard: *See*—
St. Georgiev, Vasil; Loev, Bernard; Mack, Robert; and Musser, John, 4,276,292, Cl. 424-248.400.

Logan, David J.: *See*—
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Lohr & Bromkamp: *See*—
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Lomenick, William: *See*—
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Long, Virgil L., Sr.: *See*—
Grosser, Richard W.; and Long, Virgil L., Sr., 4,275,882, Cl. 272-117.000.

Loos, Wolfgang: *See*—
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Loposer, Thomas L., to E-Systems, Inc. Scan pattern estimator for an electromagnetic sensor. 4,276,550, Cl. 343-100.0CL.

Lord, Billy J.: *See*—
Tellander, Linn; and Lord, Billy J., 4,275,713, Cl. 128-66.000.

Lorenz, Donald H.: *See*—
Gruber, Bruce A.; and Lorenz, Donald H., 4,276,136, Cl. 204-159.220.

Louis, Eckhart: *See*—
Burkhardt, Jurgen; and Louis, Eckhart, 4,276,425, Cl. 556-460.000.

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Lucas Industries Limited: *See*—
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Warwicker, Peter G., 4,276,000, Cl. 417-302.000.

Ludecke, Otto A.: *See*—
Bly, Kenneth B.; Gutwald, Mark J.; and Ludecke, Otto A., 4,276,066, Cl. 55-287.000.

Ludwa, Raymond J.; Forry, Mark E.; and Haugen, Marilyn M., to Procter & Gamble Company, The. Absorbent article. 4,276,338, Cl. 428-137.000.

Lueck, Phyllis E. Method of teaching. 4,276,031, Cl. 434-260.000.

Luecke, Francis S.: *See*—
Baasch, Holger J.; and Luecke, Francis S., 4,276,574, Cl. 360-121.000.

Lustig, Leopold P. Parapulpal dental restorative pins with self-anchoring anti-rotational retention heads. 4,276,027, Cl. 433-225.000.

Lutz, Erno B., to Solfan Systems, Inc. Microwave speed meter. 4,276,548, Cl. 343-7.0PL.

Lutz, Irvin H., to Davy Inc. Purification of coke. 4,276,120, Cl. 202-100.000.

Luzheisky, Vladimir A.: *See*—
Stakhov, Alexei P.; Solyanichenko, Nikolai A.; Luzheisky, Vladimir A.; Ovodenko, Alexandr V.; and Kozak, Andrei A., 4,276,608, Cl. 364-768.000.

Lyon, David; and Moss, Gerald, to United States of America, U.S. Environmental Protection Agency. Fluidized bed systems. 4,276,062, Cl. 55-77.000.

Lyons, Harold D., to Milliken Research Corporation. Breathable leather-like materials and process for making same. 4,276,101, Cl. 156-61.000.

Lyons, Jerry L.; and Mertz, Denny W., to Essex Cryogenics of Missouri, Inc. Automatic valve actuator. 4,275,754, Cl. 137-75.000.

M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Laussermair, Friedrich; and Willeitner, Eberhard, 4,276,068, Cl. 55-348.000.
Muller, Eckart, 4,275,845, Cl. 239-533.120.

Macdonald, Douglas J. L. Anti-lock brake devices. 4,275,934, Cl. 303-119.000.

MacGillivray, John A. Horse exerciser drive mechanism. 4,275,686, Cl. 119-29.000.

Macierewicz, Jacek J., to Elast-O-Cor Products & Engineering Limited. Deaerator for pulp stock. 4,276,059, Cl. 55-52.000.

Mack, Robert: *See*—
St. Georgiev, Vasil; Loev, Bernard; Mack, Robert; and Musser, John, 4,276,292, Cl. 424-248.400.

Macko, Joseph E., to Westinghouse Electric Corp. Solids mass flow determination. 4,275,601, Cl. 73-861.040.

MacLeod, Robert, Jr.: *See*—
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Madonna, Peter L.: *See*—
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Maeda, Toshiyuki: *See*—
Sakamaki, Hiroshi; Maeda, Toshiyuki; Ushijima, Fumihiro; and Saitou, Tadashi, 4,276,007, Cl. 418-152.000.

Magline, Inc.: *See*—
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Mahoney, Robert D.: *See*—
Kell, Michael J.; and Mahoney, Robert D., 4,276,173, Cl. 210-500.200.

Maki, Michiyoshi: *See*—
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Makovec, Donald J.: *See*—
Hutson, Thomas, Jr.; Makovec, Donald J.; and Beckworth, Alden E., 4,276,439, Cl. 585-720.000.

Mallott, Louis J., Sr. Implement for attaching hangers. 4,275,621, Cl. 81-111.000.

Maly, Hans-Peter: *See*—
Heitmann, Jurgen; Illetschko, Gerhard; and Maly, Hans-Peter, 4,276,563, Cl. 358-139.000.

Manabe, Toshikatsu; Nonogaki, Sabaro; Morishita, Hajime; Uchino, Shoichi; Tomita, Yoshifumi; Nishizawa, Masahiro; Yokomizo, Hiroshi; and Ohmatoi, Susumu, to Hitachi, Ltd.; and Kasei Optonix, Ltd. Process for forming phosphor screens with treated phosphors. 4,276,363, Cl. 430-28.000.

Mandai, Masaaki: *See*—
Satoh, Katsuhiko; Asano, Kazuhiro; Mandai, Masaaki; Ueda, Makoto; Torisawa, Akira; and Shida, Masaharu, 4,276,626, Cl. 368-80.000.

Mandelcorn, Lyon; Dakin, Thomas W.; and Miller, Robert L., to Westinghouse Electric Corp. Dielectric fluids comprising nonhalogenated mixtures of organic esters and aromatic compounds. 4,276,184, Cl. 252-579.000.

Manina, Mitch; and Lomenick, William. Electrical connecting plug. 4,275,946, Cl. 339-183.000.

Mann, Egon: *See*—
Ehrlinger, Friedrich; Mann, Egon; Fischer, Manfred; and Jocham, Rudolf, 4,275,616, Cl. 74-730.000.

Manning, William P.; Rehm, Stephen J.; and Schmuhl, Jeffrey L., to Combustion Engineering, Inc. Process for the removal of hydrogen sulfide from gas mixtures. 4,276,271, Cl. 423-226.000.

Manoury, Jean: *See*—
Aguinet, Gerard; Le Bras, Andre; Manoury, Jean; and Martin, Edouard, 4,276,277, Cl. 423-393.000.

Mansell, John R.: *See*—
Stone, Henry D.; Knapp, Alan G.; Mansell, John R.; Overall, Colin D.; and Washington, Derek, 4,276,127, Cl. 204-24.000.

Maranghi, Marco, to Prato Commerz. S.p.A. Method for preventing a surface exit of fibers from an unwoven fabric, through a very thin layer of emulsified latex, and product thereby obtained. 4,276,345, Cl. 428-284.000.

Marchal, Paul H. L.: *See—*
Remillieux, Jean; Rebours, Albert; Dumortier, Philippe; and Marchal, Paul H. L., 4,276,019, Cl. 432-1.000.

Marchetti, Augusto. Automatic machine for closing the lower flaps of a parallelepiped box with foldable flaps and for retaining the box in a filling position. 4,275,543, Cl. 53-374.000.

Marcus, Konrad H., to Prince Corporation. Vehicle storage receptacle. 4,275,913, Cl. 296-37.100.

Marcus, Konrad H., to Prince Corporation. Auxiliary visor. 4,275,917, Cl. 296-97.00R.

Marcus, Mitchell P.: *See—*
Bolcavage, Richard D.; Fleek, Arthur E.; and Marcus, Mitchell P., 4,275,653, Cl. 101-93.140.

Maric, Petar. Accordion with a new order of sounds and mechanical reed opening system. 4,275,635, Cl. 84-376.00R.

Maricelli, James J., to Schlumberger Technology Corporation. Method of processing well logging data. 4,276,599, Cl. 364-422.000.

Marinoff, Gerald P. Ophthalmological surgical instrument. 4,275,733, Cl. 128-303.00R.

Marinucci, Roberto. Multi-complex shear device for splitting hot metallic bars into several smaller bars. 4,275,491, Cl. 29-33.00R.

Marker, Leon F.: *See—*
Aggarwal, Sundar L.; Marker, Leon F.; Dudek, Thomas J.; and Herold, Robert J., 4,276,009, Cl. 425-130.000.

Markezich, Ronald L.; Olander, Walter K.; and Axelrod, Robert J., to General Electric Company. Hindered phenol phosphites. 4,276,233, Cl. 260-937.000.

Markowitz, Allen: *See—*
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Markusch, Peter: *See—*
Scholl, Hans-Joachim; Dieterich, Dieter; and Markusch, Peter, 4,276,404, Cl. 528-57.000.

Mars Limited: *See—*
Burrows, Ian E.; and Cheney, Peter A., 4,276,311, Cl. 426-56.000.

Marteau, Jean M., to Quantel S.A. High yield diffraction limited laser oscillator. 4,276,519, Cl. 331-94.50C.

Martin, Charles R.: *See—*
Tarbon, Philip B.; and Martin, Charles R., 4,275,554, Cl. 57-263.000.

Martin, Edouard: *See—*
Aguinet, Gerard; Le Bras, Andre; Manoury, Jean; and Martin, Edouard, 4,276,277, Cl. 423-393.000.

Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, to Abbott Laboratories. Fortimicin intermediates for producing 2-deoxyfortimicins. 4,276,413, Cl. 536-17.00R.

Martin, Larry D., to Halliburton Company. Methods and compositions for removing deposits containing iron sulfide from surfaces comprising basic aqueous solutions of particular chelating agents. 4,276,185, Cl. 252-87.000.

Martin, Lindley, to Mayze, Roderick R. Decorative plate and method of making same. 4,275,518, Cl. 40-324.000.

Martone, Leonard P.; and Lavigne, Ronald L., to Martone, Leonard P. Effluent treatment system. 4,276,164, Cl. 210-170.000.

Maruhashi, Yukio: *See—*
Hiruma, Hideo; and Maruhashi, Yukio, 4,276,621, Cl. 367-97.000.

Marvin, Ira E.; and Cowgill, Joseph R., to General Electric Company. Method and apparatus for controlling thrust in a gas turbine engine. 4,275,557, Cl. 60-39.030.

Massucco, Arthur A.: *See—*
Merrill, Richard E.; and Massucco, Arthur A., 4,276,367, Cl. 430-302.000.

Masuda, Kenji, to Daikin Kogyo Co., Ltd. Pressure control valve assembly. 4,275,758, Cl. 137-489.000.

Masuda, Noboru; and Sugimoto, Masakazu, to Denki Onkyo Company, Limited. Rotary actuator. 4,276,499, Cl. 318-119.000.

Masurekar, Prakash S.: *See—*
Goodhue, Charles T.; Esders, Theodore W.; and Masurekar, Prakash S., 4,276,377, Cl. 435-18.000.

Masuzawa, Sigeaki: *See—*
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Matejec, Reinhart: *See—*
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Matovich, Edwin; and Copelan, James B. Method for making a fabric reactor tube. 4,275,493, Cl. 29-454.000.

Matrix Toys, Inc.: *See—*
Gabriel, Richard J., 4,275,524, Cl. 46-23.000.

Matskevich, Vladimir I.: *See—*
Anoshko, Vladimir A.; Godin, Eduard M.; Gavrilov, Anatoly N.; Zverkov, Garik E.; Matskevich, Vladimir I.; Chepurin, Valentin M.; Semenov, Valentin P.; Grachev, Vladimir V.; and Butylin, Mikhail Y., 4,275,579, Cl. 72-59.000.

Matson, Jack V. Industrial waste-water reuse by selective silica removal over activated alumina. 4,276,180, Cl. 210-683.000.

Matsuda, Yasuo: *See—*
Okawa, Tadashi; Honbu, Mitsuyuki; Matsuda, Yasuo; Shibata, Takanori; and Kawaguchi, Toshio, 4,276,589, Cl. 363-71.000.

Matsuhisa, Koh; and Takezawa, Mamoru, to Ricoh Company, Ltd. Printing machine. 4,275,969, Cl. 400-625.000.

Matsui, Katsuhiko; Kashiwaba, Yukio; and Kishimoto, Yoshioki, to Nissan Motor Company, Limited. Fuel filter provided with a water level detecting means. 4,276,161, Cl. 210-86.000.

Matsui, Yoshiya: *See—*
Midorikawa, Koyo; Tsunoda, Atsuo; Murase, Hidetoshi; Mochizuki, Noritaka; Minami, Setsuo; Matsui, Yoshiya; Moriwaki, Masazumi; and Suzuta, Mikio, 4,275,962, Cl. 355-1.000.

Matsumoto, Seiji: *See—*
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Matsumura, Osamu; Kato, Yutaka; Sekiguchi, Tsunetoshi; and Namiki, Ryo, to Citizen Watch Company Limited. Solar battery timepiece. 4,276,629, Cl. 368-86.000.

Matsuoka, Hideoki; and Kondo, Yoshinobu, to Nissan Motor Company, Limited; and Fuji Kiko Company, Limited. Passive seat belt arrangement with wheeled belt carrier. 4,275,903, Cl. 280-803.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Kanzaki, Nobuyoshi; Toyama, Kenji; Nakano, Katsutoshi; Shimatani, Ryoichi; and Kudo, Fumio, 4,276,129, Cl. 204-58.000.
Mitsuyu, Tsuneo; Wasa, Kiyotaka; and Hayakawa, Shigeru, 4,276,535, Cl. 338-22.00R.
Nagamoto, Shun'ichi; and Sakamoto, Kazuho, 4,276,468, Cl. 235-92.0CT.
Nishino, Atsushi; Yoshida, Akihiko; and Ogino, Nobukuni, 4,276,128, Cl. 204-38.00A.
Obata, Shuichi; and Ito, Masashi, 4,276,635, Cl. 369-256.000.

Matsushita Electric Works, Ltd.: *See—*
Takagi, Takeshi; and Abo, Tokushi, 4,275,862, Cl. 248-205.00A.

Matsuzawa, Takashi: *See—*
Takami, Katsumi; and Matsuzawa, Takashi, 4,276,633, Cl. 368-227.000.

Mattern, Gunter: *See—*
Brechbuhler, Hans U.; Mattern, Gunter; and Traber, Walter, 4,276,302, Cl. 424-273.00R.

Maura, Nicholas J. Snowplow extensions. 4,275,514, Cl. 37-42.00R.

Maurer, Roland: *See—*
Assmus, Friedrich; Flaig, Hans; Wolber, Robert; and Maurer, Roland, 4,276,634, Cl. 368-300.000.

Mayer, Nathan. Apparatus and method for providing an aseptic surgical environment. 4,275,719, Cl. 128-132.00D.

Mayer, William N., to Modern Controls, Inc. Plasma display panel. 4,276,492, Cl. 313-188.000.

Mayers, Richard R.; Huebner, Steven R.; and Chojnacki, Dennis A., to Midland-Ross Corporation. Internal cooling of heat exchanger tubes. 4,275,569, Cl. 62-373.000.

Mayze, Roderick R.: *See—*
Martin, Lindley, 4,275,518, Cl. 40-324.000.

McAllister, Gary L., to Jersey Nuclear-Avco Isotopes, Inc. CO Pumped CO_2 16 micron laser. 4,276,517, Cl. 331-94.50P.

McCalmont, Arnold M.; and Slate, Matthew W., to Technical Communications Corp. Secure communication system with improved frequency-hopping arrangement. 4,276,652, Cl. 455-29.000.

McCartin, Peter J.; and Nebe, William J., to Du Pont de Nemours, E. I., and Company. Process of using positive and negative working imaging systems from photoactive plastisols. 4,276,366, Cl. 430-291.000.

McDonald, Ray S.; and Rossing, Martin A., to Medtronic, Inc. Digital cardiac pacemaker clocking means. 4,275,738, Cl. 128-419.0PG.

McDonald, Richard J. Security scrap storage container or bin. 4,275,830, Cl. 232-43.100.

McDowell, Jerry T., to Ball Corporation. Separator-cutter. 4,275,629, Cl. 83-302.000.

McFarlane, Richard B. Pneumatic tire inserts. 4,275,782, Cl. 152-314.000.

McGilvery, James D., to ERCO Industries Limited. Production of sodium polyphosphates. 4,276,273, Cl. 423-305.000.

McGowan, Robert J.: *See—*
Dubberly, Gregory T.; and McGowan, Robert J., 4,276,467, Cl. 235-92.0PK.

McHale, William D.; and Schoennagel, Hans-Juergen, to Mobil Oil Corporation. Reforming of sulfur-containing charge stock. 4,276,152, Cl. 208-139.000.

McHenry, Keith W., Jr., to Standard Oil Company (Indiana). Fluid catalytic cracking of heavy petroleum fractions. 4,276,150, Cl. 208-120.000.

McIntire, William S.: *See—*
Brewer, Arthur D.; Neidermyer, Robert W.; and McIntire, William S., 4,276,422, Cl. 549-15.000.

McIsaac, Lyle D.; Krupa, Joseph F.; and Schroeder, Norman C., to United States of America, Energy. Method for purifying bidentate organophosphorous compounds. 4,276,235, Cl. 260-990.000.

McLyman, W. T.; and Frosch, Robert A. Push-pull converter with energy saving circuit for protecting switching transistors from peak power stress. 4,276,588, Cl. 363-56.000.

McMurry-Hughes, Inc.: *See—*
Abercrombie, Bolling A., 4,275,790, Cl. 166-314.000.
Atwood, John E.; Baugh, John L.; Koehler, William M.; and Waterman, David K., 4,275,592, Cl. 73-432.00R.

McNamee, James W.; Homstad, Gerald E.; Vazquez-Cuervo, Alfonso; and Henry, Kenneth J., to General Motors Corporation. Noise tolerant multiplex system. 4,276,640, Cl. 370-77.000.

Mead Corporation, The: *See—*
Dubberly, Gregory T.; and McGowan, Robert J., 4,276,467, Cl. 235-92.0PK.

Medicor Muvek: *See—*
Meszaros, Sandor; Kirchner, Gabriella; Balzer, Janos; and Wild, Karoly, 4,276,478, Cl. 250-468.000.

Medtronic, Inc.: *See—*
McDonald, Ray S.; and Rossing, Martin A., 4,275,738, Cl. 128-419.0PG.
Thompson, David L.; and Stein, Marc T., 4,275,737, Cl. 128-419.0PG.
Meetze, Murray O., Jr.: *See—*
Sullivan, William E.; and Meetze, Murray O., Jr., 4,276,236, Cl. 261-30.000.
Mercier, Gil A.: *See—*
St. John, Charles F.; and Mercier, Gil A., 4,276,092, Cl. 106-100.000.
Mercier, Henri A.: *See—*
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Merck & Co., Inc.: *See—*
Jones, Howard; Clark, Robert L.; and Zimmerman, Morris, 4,276,298, Cl. 424-270.000.
Merlin Gerin: *See—*
Gerbert-Gaillard, Alain; and Morel, Robert, 4,276,527, Cl. 335-39.000.
Merrill, Richard E.; and Massucco, Arthur A., to Arthur D. Little, Inc. Method of preparing lithographic printing plates using novel compounds and compositions, and improved lithographic printing plates. 4,276,367, Cl. 430-302.000.
Merritt, Carleton G. Encapsulation of materials. 4,276,312, Cl. 426-96.000.
Merry, Jack D., to Kendall Company, The. Anesthesia device. 4,275,728, Cl. 128-215.000.
Merten, Gerhard; Breuer, Oswald; and Bernd, Steinkuhl, to Gewerkschaft Eisenhutte Westfalia. Mineral mining plough with worm adjustable roof cutter. 4,275,927, Cl. 299-34.000.
Mertz, Denny W.: *See—*
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Messerschmitt-Boelkow-Biochm Gesellschaft mit beschrankter Haftung: *See—*
Hahn, Andreas, 4,276,004, Cl. 417-479.000.
Messerschmitt-Boelkow-Biohm Gesellschaft mit beschrankter Haftung: *See—*
Bschorr, Oskar, 4,275,801, Cl. 181-290.000.
Meszaros, Sandor; Kirchner, Gabriella; Balzer, Janos; and Wild, Karoly, to Medicor Muvek. Universal flat-film-changing device. 4,276,478, Cl. 250-468.000.
Metallgesellschaft Aktiengesellschaft: *See—*
Blumrich, Walter; Dorr, Karl H.; Konig, Hans J.; and Sander, Ulrich, 4,276,116, Cl. 159-47.00R.
Metco, Inc.: *See—*
Novinski, Edward R.; and Harrington, John H., 4,276,353, Cl. 428-558.000.
Metzenauer & Jung GmbH: *See—*
Alter, Siegfried, 4,276,458, Cl. 200-153.00J.
Meuse, Kenneth P.: *See—*
Lockwood, Francis R.; and Meuse, Kenneth P., 4,276,016, Cl. 431-323.000.
Meyer, Hans R., to Ciba-Geigy Corporation. Process for manufacturing 2-stilbenyl-1,2,3-triazoles and new 2-stilbenyl-1,2,3-triazoles. 4,276,188, Cl. 252-301.220.
Meyer, Juergen; Schaaf, Norbert; and Kunze, Claus, to Heimann GmbH. A contactless resistance potentiometer. 4,276,534, Cl. 338-15.000.
Meyer, Stanley A. Light-guide lens. 4,275,950, Cl. 350-96.100.
Meyers, Stanley T. Sound reproducing system utilizing motional feedback and velocity-frequency equalization. 4,276,443, Cl. 179-1.00F.
Miano, Jeffrey D.; and Sandler, Starley R., to Pennwalt Corporation. Ureas containing the 2,2,2-trichloroethyl group as flame retardants for polyurethane foams. 4,276,387, Cl. 521-167.000.
Mibu, Hiroaki; Ishihara, Tadashi; Tanaka, Chiaki; and Esaki, Shingo, to Japan Storage Battery Co., Ltd.; and Nippon Paint Co., Ltd. Apparatus for curing photo-curable composition. 4,276,479, Cl. 250-492.00R.
Microlec S.A.: *See—*
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Middleman, Lee M.; and Goodrich, Roger S., to Raychem Corporation. Heater with distributed heating element. 4,276,466, Cl. 219-523.000.
Midland-Ross Corporation: *See—*
Mayers, Richard R.; Huebner, Steven R.; and Chojnacki, Dennis A., 4,275,569, Cl. 62-373.000.
Midorikawa, Koyo; Tsunoda, Atsuo; Murase, Hidetoshi; Mochizuki, Noritaka; Minami, Setsuo; Matsui, Yoshiya; Moriwaki, Masazumi; and Suzuta, Mikio, to Canon Kabushiki Kaisha. Projection device. 4,275,962, Cl. 355-1.000.
Mifune, Hiroyuki; Miyasaka, Nobuaki; and Fuseya, Yoshiharu, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion with thioether sensitizer. 4,276,374, Cl. 430-611.000.
Mihara, Teruyoshi: *See—*
Tominaga, Tamotsu; Mihara, Teruyoshi; Oguro, Takeshi; and Takeuchi, Masami, 4,276,533, Cl. 338-4.000.
Miko, Richard J.; and Shapiro, Daniel H., to Edo Corporation. Reusable disc filter with spacing bosses for high temperature gasses. 4,276,065, Cl. 55-278.000.
Miksic, Boris A.; and Miller, Robert H. Corrosion inhibiting articles. 4,275,835, Cl. 239-60.000.
Miller, Alan H., to Cellu Products Company. Receptacle for containing and displaying food products. 4,275,811, Cl. 206-204.000.
Miller, David L., to American Air Filter Company, Inc. Filter arrangement. 4,276,069, Cl. 55-379.000.
Miller, Harry C., to Sargent & Greenleaf, Inc. Combination lock for safe doors and the like. 4,275,576, Cl. 70-303.00A.
Miller, Kenneth J., to Caterpillar Tractor Co. Method for increasing the fin density of a heat exchanger. 4,275,581, Cl. 72-385.000.
Miller, Ralph W.; and Peterson, James G., to TRW Inc. Monolithic triple diffusion analog to digital converter. 4,276,543, Cl. 340-347.0AD.
Miller, Richard A., to IT Enviroscience, Inc. Destruction method for the wet combustion of organics. 4,276,198, Cl. 252-438.000.
Miller, Robert E., to Appleton Papers Inc. Pressure-sensitive record material. 4,275,905, Cl. 282-27.500.
Miller, Robert H.: *See—*
Miksic, Boris A.; and Miller, Robert H., 4,275,835, Cl. 239-60.000.
Miller, Robert L.: *See—*
Mandelcorn, Lyon; Dakin, Thomas W.; and Miller, Robert L., 4,276,184, Cl. 252-579.000.
Miller, William L. Smoking pipe. 4,275,747, Cl. 131-195.000.
Milliken Research Corporation: *See—*
Lyons, Harold D., 4,276,101, Cl. 156-61.000.
Mills, Roy H., to Westeel-Rosco Limited-Westeel-Rosco Limitee. Method of disassembly of jointed structure. 4,275,492, Cl. 29-426.500.
Minami, Setsuo: *See—*
Midorikawa, Koyo; Tsunoda, Atsuo; Murase, Hidetoshi; Mochizuki, Noritaka; Minami, Setsuo; Matsui, Yoshiya; Moriwaki, Masazumi; and Suzuta, Mikio, 4,275,962, Cl. 355-1.000.
Mink, Hans G.: *See—*
Spanjersberg, Albertus C.; Mink, Hans G.; and Barwegen, Johannes H. M., 4,275,834, Cl. 239-3.000.
Minnesota Mining and Manufacturing Company: *See—*
Kruschel, William A., 4,275,584, Cl. 72-410.000.
Teetzel, Michael L.; and James, Ralph E., 4,275,529, Cl. 51-334.000.
Minolta Camera Kabushiki Kaisha: *See—*
Imaizumi, Masaru, 4,275,876, Cl. 271-8.00R.
Uesugi, Kyozo, 4,275,952, Cl. 350-429.000.
Minowa, Masao: *See—*
Ishihara, Eisuke; Yonehara, Hiroshi; Akasaki, Katsuyuki; Minowa, Masao; and Kobayashi, Katsumi, 4,276,286, Cl. 424-117.000.
Mita, Ryuichi: *See—*
Sakai, Katsuya; Mita, Ryuichi; Kato, Toshio; Higuchi, Chojiro; and Murakami, Hisamichi, 4,276,187, Cl. 252-186.000.
Mitchell, Peter G.: *See—*
Bohman, Carl E.; and Mitchell, Peter G., 4,275,546, Cl. 56-10.200.
Mitchiner, Robert K., to Valleylab, Inc. Cryosurgical apparatus and method. 4,275,734, Cl. 128-303.100.
Mitono, Yoshiharu: *See—*
Enomoto, Hiromu; Yasuda, Yasushi; Ohmichi, Hitoshi; and Mitono, Yoshiharu, 4,276,556, Cl. 357-52.000.
Mitsubishi Chemical Industries Limited: *See—*
Imahori, Seiichi; Hihara, Toshio; Yomeyama, Tomio; and Hirota, Takao, 4,276,047, Cl. 8-532.000.
Mitsubishi Petrochemical Co., Ltd.: *See—*
Yukawa, Hideaki; Osumi, Kazuoki; Nara, Terukazu; and Takayama, Yoshihiro, 4,276,380, Cl. 435-115.000.
Mitsubishi Rayon Company, Ltd.: *See—*
Sakimae, Akihiro; and Onishi, Hisao, 4,276,381, Cl. 435-179.000.
Mitsuboshi Belting Ltd.: *See—*
Takano, Hiroshi, 4,276,039, Cl. 474-205.000.
Mitsui Engineering and Shipbuilding Co., Ltd.: *See—*
Yoshitake, Masami; and Yamaguchi, Fumiaki, 4,276,153, Cl. 208-48.00Q.
Mitsui Petrochemical Industries, Ltd.: *See—*
Shimada, Koji; and Koike, Seiji, 4,276,347, Cl. 428-332.000.
Yoshitake, Masami; and Yamaguchi, Fumiaki, 4,276,153, Cl. 208-48.00Q.
Mitsui Toatsu Chemicals Incorporated: *See—*
Sakai, Katsuya; Mita, Ryuichi; Kato, Toshio; Higuchi, Chojiro; and Murakami, Hisamichi, 4,276,187, Cl. 252-186.000.
Mitsuyu, Tsuneo; Wasa, Kiyotaka; and Hayakawa, Shigeru, to Matsushita Electric Industrial Co., Ltd. Thermistor. 4,276,535, Cl. 338-22.00R.
Miyake, Katsuya, to Akebono Brake Industry Co. Ltd. Antiskid device. 4,275,933, Cl. 303-106.000.
Miyasaka, Nobuaki: *See—*
Mifune, Hiroyuki; Miyasaka, Nobuaki; and Fuseya, Yoshiharu, 4,276,374, Cl. 430-611.000.
Mobil Oil Corporation: *See—*
Chester, Arthur W.; and Stover, William A., 4,276,149, Cl. 208-120.000.
Chu, Chin-Chiun, 4,276,437, Cl. 585-467.000.
Chu, Chin-Chiun, 4,276,438, Cl. 585-467.000.
McHale, William D.; and Schoennagel, Hans-Juergen, 4,276,152, Cl. 208-139.000.
Plank, Charles J.; Rosinski, Edward J.; and Givens, Edwin N., 4,276,151, Cl. 208-138.000.
Mochizuki, Noritaka: *See—*
Midorikawa, Koyo; Tsunoda, Atsuo; Murase, Hidetoshi; Mochizuki, Noritaka; Minami, Setsuo; Matsui, Yoshiya; Moriwaki, Masazumi; and Suzuta, Mikio, 4,275,962, Cl. 355-1.000.
Mock, Arthur E., to Haakonsen, Haakon, a part interest. Distillation system for sea water. 4,276,124, Cl. 202-236.000.
Modern Controls, Inc.: *See—*
Mayer, William N., 4,276,492, Cl. 313-188.000.
Moen, Alfred M., to Stanadyne, Inc. Automatically adjustable shower head. 4,275,843, Cl. 239-499.000.

Mohn, Hans-Werner; Buchholz, Rainer; Hoveler, Egon; and Zodrow, Rudolf, to Jagenberg-Werke AG. Support for rotatable platforms for bottles. 4,275,807, Cl. 198-344.000.
Moirano, Arthur L., to FMC Corporation. Compositions and method for preparing dessert gels. 4,276,320, Cl. 426-575.000.
Moll, Franz: *See*—
Wernicke, Ubbo; Matejec, Reinhart; and Moll, Franz, 4,276,372, Cl. 430-505.000.
Molnar, Thomas G., to Repco Limited. Vehicle cushion. 4,275,923, Cl. 297-250.000.
Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr.; and Pabodie, Robert M., 4,275,654, Cl. 101-110.000.
Monnerat, Georgia A.; Ham, George E.; Hairston, Thomas J.; and Hatch, Melvin J., to Dow Chemical Company, The. Catalyst for reacting phenolic hydroxyl groups with epoxy groups. 4,276,406, Cl. 528-92.000.
Monsanto Company: *See*—
Convent, Bernard, 4,276,079, Cl. 71-100.000.
Holladay, Harry P., 4,276,249, Cl. 264-139.000.
Mount, Ramon A.; and Robinson, Warn D., 4,276,222, Cl. 260-346.750.
Wu, Wen-li; and Black, William B., 4,276,348, Cl. 428-373.000.
Montague, Douglas P.: *See*—
Morrison, Howard J.; and Montague, Douglas P., 4,275,970, Cl. 401-6.000.
Montgomery, Francis E.: *See*—
Colvin, Robert E.; Douda, Bernard E.; Montgomery, Francis E.; and Short, James E., Jr., 4,276,100, Cl. 149-109.600.
Montgomery, Robert L.; and Smith, Stuart B., to Southeastern Foam Products, Inc. Apparatus for molding expandable thermoplastic polymer particles. 4,276,008, Cl. 425-4.00R.
Moore, Curtis L.: *See*—
Benke, Frank W.; and Moore, Curtis L., 4,276,530, Cl. 336-58.000.
Moore, Nicholas R.: *See*—
Perkins, Gerald S.; and Moore, Nicholas R., 4,276,003, Cl. 417-415.000.
Moran, Francis, to Union Chimique et Industrielle de l'Ouest S.A. Anticorrosion composition. 4,276,089, Cl. 106-14.120.
Morel, Robert: *See*—
Gerbert-Gaillard, Alain; and Morel, Robert, 4,276,527, Cl. 335-39.000.
Moretto, Hans-Heinrich: *See*—
Wieder, Wolfgang; Witte, Josef; Moretto, Hans-Heinrich; and Steinberger, Helmut, 4,276,389, Cl. 525-61.000.
Morgan, Bennie E. Mine roof anchor system. 4,275,975, Cl. 405-261.000.
Morgan, Stanley A.; and Dixon, Edgar A. Cushion disc for phonograph records. 4,276,636, Cl. 369-291.000.
Morimoto, Kengi: *See*—
Mouri, Takenori; Morimoto, Kengi; Yoshimoto, Itaru; Kayama, Hiroyki; Okazawa, Yukio; and Sizukuisi, Touru, 4,275,648, Cl. 99-483.000.
Morinaga, Shigeki: *See*—
Tokuda, Hiroatsu; Morinaga, Shigeki; and Nakamura, Hideo, 4,276,601, Cl. 364-431.000.
Morishita, Hajime: *See*—
Manabe, Toshikatsu; Nonogaki, Saburo; Morishita, Hajime; Uchino, Shoichi; Tomita, Yoshifumi; Nishizawa, Masahiro; Yokomizo, Hiroshi; and Ohmatoi, Susumu, 4,276,363, Cl. 430-28.000.
Moriwaki, Masazumi: *See*—
Midorikawa, Koyo; Tsunoda, Atsuo; Murase, Hidetoshi; Mochizuki, Noritaka; Minami, Setsuo; Matsui, Yoshiya; Moriwaki, Masazumi; and Suzuta, Mikio, 4,275,962, Cl. 355-1.000.
Morley, Richard E., to Gould Inc. Modicon Division. Digital computer with multi-processor capability utilizing intelligent composite memory and input/output modules and method for performing the same. 4,276,594, Cl. 364-200.000.
Moro, Christian D.; and Ranini, Daniel G., to Poclain. Welded structure of a power arm. 4,275,542, Cl. 52-731.000.
Moron, Jacques: *See*—
Andreucci, Pierre; and Moron, Jacques, 4,276,638, Cl. 370-30.000.
Morris, Paul E.: *See*—
Fettel, Bruce E.; Morris, Paul E.; and Lichte, Leo J., 4,276,132, Cl. 204-129.100.
Morrison, Howard J.; and Montague, Douglas P., to Dart Industries Inc. Plant care kit. 4,275,970, Cl. 401-6.000.
Mortenson, Carl N., to Magline, Inc. Hand truck construction assembly. 4,275,894, Cl. 280-5.240.
Morton, George I.: *See*—
Goldman, Michael B.; and Morton, George I., 4,276,592, Cl. 363-147.000.
Morton, Robert W.: *See*—
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Mosetti, Jacques: *See*—
Porta, Augusto; and Mosetti, Jacques, 4,276,134, Cl. 204-153.000.
Moss, Edward L., to Moss Machinery Manufacturers, Inc. Dual flap carton erecting machine. 4,275,644, Cl. 493-316.000.
Moss, Gerald: *See*—
Lyon, David; and Moss, Gerald. 4,276,062, Cl. 55-77.000.
Moss Machinery Manufacturers, I: ...: *See*—
Moss, Edward L., 4,275,644, Cl. 493-316.000.
Moss, Mark W. Data card reader. 4,276,469, Cl. 235-458.000.
Motoren- und Turbinen Union Munchen GmbH: *See*—
Kappler, Guenter; and Fehler, Adolf, 4,275,564, Cl. 60-738.000.
Motorola, Inc.: *See*—
Bench, Stephen M.; Dirkes, William R.; Juglekar, Manohar A.; Secora, James C.; and Stephen, Michael A., 4,276,651, Cl. 375-120.000.
Mount, Ramon A.; and Robinson, Warn D., to Monsanto Company. Method of producing maleic anhydride. 4,276,222, Cl. 260-346.750.
Mouri, Takenori; Morimoto, Kengi; Yoshimoto, Itaru; Kayama, Hiroyki; Okazawa, Yukio; and Sizukuisi, Touru, to Toyo Seikan Kaisha Limited. Method and apparatus for producing fruit juices. 4,275,648, Cl. 99-483.000.
Moutard, Anne-Marie E. J.: *See*—
Bonzom, Albert; Crepaux, Alain P.; and Moutard, Anne-Marie E. J., 4,276,246, Cl. 264-53.000.
Mowles, Kenneth L., to Hennessy Products, Inc. Railway car lubricated center bearing. 4,275,661, Cl. 105-199.00C.
Moyer, James E. Trailer equalizer spring bar holder. 4,275,897, Cl. 280-406.00A.
Mueller, Felix, to Chemap A.G. Fermenter. 4,276,384, Cl. 435-311.000.
Muenchow, John R.; Pastorino, Ronald L.; Halle, Reidar; and Lewis, Roger N., to Argus Chemical Corporation. Cyclic peroxyketal crosslinking/blowing agents for polyethylene. 4,276,247, Cl. 264-54.000.
Mukaiyama, Teruaki; and Sakito, Yoji, to Sumitomo Chemical Company, Limited. Method for producing 1,5-dimethyl-6,8-dioxabicyclo[3.2.1]octane. 4,276,217, Cl. 260-340.90R.
Muller, Eckart, to M.A.N Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Fuel injector for internal combustion engines. 4,275,845, Cl. 239-533.120.
Muller, Hans; and Guazzone, Bruno, to Chemap A.G. Filter apparatus and a method of cleaning filter elements thereof. 4,276,166, Cl. 210-327.000.
Muller, Horst; and Frey, Volker, to Wacker-Chemie GmbH. Process for preparing silicon-containing acetamide derivatives. 4,276,423, Cl. 556-411.000.
Muller, Jean-Claude; and Ramuz, Henri, to Hoffmann-La Roche Inc. Oxadiazolotriazine derivatives. 4,276,417, Cl. 544-198.000.
Muller, Josef: *See*—
Pohler, Friedmar; Falk, Hans; Muller, Josef; Klein, Hans J.; and Hoffacker, Franz, 4,276,324, Cl. 427-10.000.
Mullier, Alain: *See*—
Welsh, Jay Y.; Mullier, Alain; and Picquet, Pierre C., 4,276,268, Cl. 423-49.000.
Mullis, Charles. Clamping apparatus. 4,275,872, Cl. 269-72.000.
Multinorm, B.V.: *See*—
Oosterling, Pieter A.; and van Staveren, Hendricus C., 4,275,547, Cl. 56-13.600.
Muns, Joaquin M. Stop mechanism for Rachel or Ketten type knitting machine. 4,275,574, Cl. 66-163.000.
Murakami, Hisamichi: *See*—
Sakai, Katsuya; Mita, Ryuichi; Kato, Toshio; Higuchi, Chojiro; and Murakami, Hisamichi, 4,276,187, Cl. 252-186.000.
Muranaka, Tsutomu: *See*—
Ohara, Isamu; Muranaka, Tsutomu; and Eizumi, Hideo, 4,276,528, Cl. 335-75.000.
Murano, Genesio: *See*—
Leighton, Stephen B.; Murano, Genesio; Markowitz, Allen; and Chikadel, Burt, 4,276,383, Cl. 435-291.000.
Murao, Masami, to Kabushiki Kaisha Murao Shoten. Gold alloy with copper, silver and zinc. 4,276,086, Cl. 75-134.00C.
Murarka, Shyam P.: *See*—
Levinstein, Hyman J.; Murarka, Shyam P.; and Sinha, Ashok K., 4,276,557, Cl. 357-67.000.
Murase, Hidetoshi: *See*—
Midorikawa, Koyo; Tsunoda, Atsuo; Murase, Hidetoshi; Mochizuki, Noritaka; Minami, Setsuo; Matsui, Yoshiya; Moriwaki, Masazumi; and Suzuta, Mikio, 4,275,962, Cl. 355-1.000.
Murata Manufacturing Co., Ltd.: *See*—
Aoki, Shigeru, 4,276,532, Cl. 337-408.000.
Kadota, Michio, 4,276,524, Cl. 333-194.000.
Nishikawa, Toshio; Tamura, Sadahiro; and Ishikawa, Youhei, 4,276,525, Cl. 333-206.000.
Murayama, Tadashi: *See*—
Fukuda, Takeo; Murayama, Tadashi; and Urui, Kiyoshi, 4,276,639, Cl. 370-62.000.
Murphy, James F.: *See*—
Schlager, Richard J.; and Murphy, James F., 4,276,272, Cl. 423-244.000.
Murphy, Raymond J. Bearing and support. 4,275,880, Cl. 272-93.000.
Murray, John T., to United Centrifugal Pumps. Internal adjustable grooving bar. 4,275,624, Cl. 82-1.200.
Musser, John: *See*—
St. Georgiev, Vasil; Loev, Bernard; Mack, Robert; and Musser, John, 4,276,292, Cl. 424-248.400.
Muste Llambrich, Pedro. Oscillation absorber for trailer hitches. 4,275,898, Cl. 280-446.00B.
Muttoni, Oscar E.: *See*—
French, John B.; and Muttoni, Oscar E., 4,276,112, Cl. 156-360.000.
Myers, Felix E., to Gould Inc. Circuit breaker having planar cradle with edge portions providing relatching and contact kicker functions. 4,276,457, Cl. 200-153.00G.
Nagaishi, Hatsuo, to Nissan Motor Company, Limited. Electronic controlled fuel injection system. 4,275,694, Cl. 123-463.000.
Nagamoto, Shun'ichi; and Sakamoto, Kazuho, to Matsushita Electric Industrial Co., Ltd. Electric home appliances. 4,276,468, Cl. 235-92.0CT.

Nagano, Hiroo; Oda, Terumi; and Fukuda, Takashi, to Sumitomo Industries, Ltd. Method for continuous electrolytic descaling of steel wire by non-contact current flow. 4,276,133, Cl. 204-145.00R.

Nagaoka, Shinji: *See*—
Kitai, Kiyoshi; Takazawa, Yuzuru; and Nagaoka, Shinji, 4,275,955, Cl. 354-268.000.

Nagase, Hiroshi; Okuyama, Toshiaki; and Kubota, Yuzuru, to Hitachi, Ltd. Control device for commutatorless motor. 4,276,504, Cl. 318-721.000.

Nagatani, Yoshio, to Nagatanien Honpo Co., Ltd. Method of preparing shaped rice food. 4,276,321, Cl. 426-618.000.

Nagatanien Honpo Co., Ltd.: *See*—
Nagatani, Yoshio, 4,276,321, Cl. 426-618.000.

Nagati, Rashed N., to Pennsylvania Engineering Corporation. Metallurgical vessel and supporting means. 4,275,871, Cl. 266-243.000.

Nakabayashi, Masamitsu; Doura, Fumihiro; and Hori, Teruo, to Takeda Chemical Industries, Ltd. Flame-spraying coating. 4,276,390, Cl. 525-61.000.

Nakada, Akira: *See*—
Imamura, Akio; Yamaga, Eiichi; and Nakada, Akira, 4,275,634, Cl. 84-1.030.

Nakajima, Yoshihisa: *See*—
Tanaka, Akio; Nakajima, Yoshihisa; and Yokomori, Shinji, 4,275,806, Cl. 194-100.00A.

Nakamura, Hideo: *See*—
Obara, Sanshiro; Tokuda, Hiroatsu; Konno, Akihiko; and Nakamura, Hideo, 4,276,602, Cl. 364-431.000.
Tokuda, Hiroatsu; Morinaga, Shigeki; and Nakamura, Hideo, 4,276,601, Cl. 364-431.000.

Nakamura, Kenji: *See*—
Oka, Hitoshi; and Nakamura, Kenji, 4,276,323, Cl. 427-8.000.

Nakamura, Shozo: *See*—
Kuroda, Michio; Nakamura, Shozo; Tsukahara, Satoshi; Akatu, Yasuaki; Sugita, Shigehisa; Kaneko, Kojiro; Sakaguchi, Seiichiro; and Oshima, Ryoichiro, 4,275,563, Cl. 60-673.000.

Nakamura, Yoichi: *See*—
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Nakano, Katsutoshi: *See*—
Kanzaki, Nobuyoshi; Toyama, Kenji; Nakano, Katsutoshi; Shimatani, Ryoichi; and Kudo, Fumio, 4,276,129, Cl. 204-58.000.

Nakano, Syuji: *See*—
Inoue, Haruhiko; and Nakano, Syuji, 4,276,598, Cl. 364-405.000.

Nakayama, Hiroshi: *See*—
Okubo, Kiyokazu; and Nakayama, Hiroshi, 4,275,614, Cl. 74-476.000.

Namiki, Ryo: *See*—
Matsumura, Osamu; Kato, Yutaka; Sekiguchi, Tsunetoshi; and Namiki, Ryo, 4,276,629, Cl. 368-86.000.

Nara, Terukazu: *See*—
Yukawa, Hideaki; Osumi, Kazuoki; Nara, Terukazu; and Takayama, Yoshihiro, 4,276,380, Cl. 435-115.000.

Natarajan, Thiagarajan: *See*—
Hansel, Allen B.; and Natarajan, Thiagarajan, 4,276,590, Cl. 363-71.000.

National Distillers and Chemical Corporation: *See*—
Cairns, Rodney J.; and Whitelaw, Stefan P., 4,275,756, Cl. 137-234.500.
Saffer, Bernard A., 4,276,126, Cl. 203-69.000.

National Petro Chemicals Corp.: *See*—
Rekers, Louis J.; and Speca, Anthony N., 4,276,399, Cl. 526-106.000.

National Semiconductor Corporation: *See*—
Congdon, James S., 4,276,516, Cl. 330-272.000.

National Starch and Chemical Corporation: *See*—
Tessler, Martin M., 4,276,414, Cl. 536-114.000.

Nations, William N.; and Kerwin, Kenneth H., II, to Pacific Marine Electronics, Inc. Scan-lock control of solid state digitally synthesized receivers. 4,276,654, Cl. 455-160.000.

NCR Corporation: *See*—
Patel, Narendra M., 4,276,609, Cl. 364-900.000.

Nebe, William J.: *See*—
McCartin, Peter J.; and Nebe, William J., 4,276,366, Cl. 430-291.000.

Necchi S.p.A.: *See*—
Carbonato, Gianfranco; and Bussolati, Camillo, 4,275,674, Cl. 112-158.00E.

Neff, Laurence M.: *See*—
Schwartz, Robert E.; Neff, Laurence M.; and Utter, Gary N., 4,275,475, Cl. 15-104.06R.

Neidermyer, Robert W.: *See*—
Brewer, Arthur D.; Neidermyer, Robert W.; and McIntire, William S., 4,276,422, Cl. 549-15.000.

Neimark, Jerry: *See*—
Costantino, Joseph A.; Heberley, Jeffrey R.; Neimark, Jerry; and Weiner, Thomas E., 4,276,472, Cl. 250-214.00B.

Neitzel, Ulrich: *See*—
Singewald, Arno; Fricke, Gunter; Neitzel, Ulrich; and Geisler, Iring, 4,276,154, Cl. 209-3.000.

Nelson, Arthur J. Tow of barges by tugs. 4,275,677, Cl. 114-246.000.

Nelson, Byron G. Breathing apparatus. 4,275,725, Cl. 128-207.140.

Nelson, John S.: *See*—
Roberts, Colin A.; Nelson, John S.; Annan, David E.; and Robertson, Angus A. J., 4,275,481, Cl. 17-50.000.

Nelson, Kenneth E., to Waters Associates, Inc. Novel photometric system. 4,276,475, Cl. 250-373.000.

Nelson, Ronald J.; and Wright, Phillip D., to Bell Telephone Laboratories, Incorporated. Batch processing of semiconductor devices. 4,276,098, Cl. 148-171.000.

Nelson, Terence J.; and Wolfe, Raymond, to Bell Telephone Laboratories, Incorporated. Ion-implanted magnetic bubble memory with merge port. 4,276,614, Cl. 365-36.000.

Nemeth, Jozsef: *See*—
Varga, Gabor; Szabo, Ferenc; Sztanyik. Ferenc; Vagvolgyi, Laszlo; and Nemeth, Jozsef, 4,275,594, Cl. 73-487.000.

Nestrick, Terry J.; and Stehl, Rudolph H., to Dow Chemical Company, The. Chromatographic column packing having a bonded organosiloxane coating. 4,276,061, Cl. 55-67.000.

New Zipper Company Limited, The: *See*—
Doelter, Gandolph, 4,275,467, Cl. 2-82.000.

Newcon Company: *See*—
Jamar, Dwight W., 4,275,866, Cl. 251-250.000.

Newns, George R.: *See*—
Beales, Keith J.; Duncon, William J.; Dunn, Anthony G.; and Newns, George R., 4,275,951, Cl. 350-96.310.

Nguyen, Hieu K.; Dieudonne, Marc P. G.; and Lager, Jean-Paul, to Le Material Telephonique. Method and apparatus for converting time-division data signals received on an incoming trunk to time-division data signals of different format for transmission over an outgoing trunk. 4,276,641, Cl. 370-99.000.

Nguyen, Thanh V.; and Wagner, Thomas J., to Ralston Purina Company. Process for the production of a granulated protein gel suitable as a meat extender. 4,276,319, Cl. 426-574.000.

Nichols, Michael F.: *See*—
Hahn, Allen W.; Nichols, Michael F.; Sharma, Ashok K.; and Hellmuth, Eckhard W., 4,276,144, Cl. 204-195.00P.

Nichols, Robert L. Suction canister with vortex flow deflector. 4,275,731, Cl. 128-276.000.

Nikolaev, Vadim V.: *See*—
Kalashnikov, Leonid F.; Kudiarov, Vladimir N.; Kushnir, Georgy M.; Shapiro, Anatoly S.; Konstantinov, Rjury I.; Nikolaev, Vadim V.; and Kunets, Vladimir K., 4,275,988, Cl. 415-74.000.

Niles, Albert B.: *See*—
Grgurich, William A.; Niles, Albert B.; and Updyke, Kenneth W., 4,275,844, Cl. 239-533.300.

Nippon Electric Co., Ltd.: *See*—
Iinuma, Kazumoto, 4,276,544, Cl. 340-347.0DD.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Baba, Michiru, 4,275,676, Cl. 114-144.00E.
Imamura, Akio; Yamaga, Eiichi; and Nakada, Akira, 4,275,634, Cl. 84-1.030.
Nishimoto, Yutaka, 4,276,515, Cl. 330-253.000.

Nippon Kogaku K.K.: *See*—
Dobashi, Toshio, 4,275,954, Cl. 354-198.000.
Utagawa, Ken, 4,276,471, Cl. 250-201.000.
Wakabayashi, Hiroshi, 4,275,855, Cl. 242-71.200.
Watanabe, Sakuji; Ohtsubo, Yoshiaki; and Toyoda, Kenji, 4,275,953, Cl. 354-33.000.

Nippon Paint Co., Ltd.: *See*—
Mibu, Hiroaki; Ishihara, Tadashi; Tanaka, Chiaki; and Esaki, Shingo, 4,276,479, Cl. 250-492.00R.

Nippon Soken, Inc.: *See*—
Kawai, Hisasi; Egami, Tsuneyuki; Kohama, Tokio; and Obayashi, Hideki, 4,275,590, Cl. 73-204.000.

Nischk, Wolfgang: *See*—
Dahm, Franz-Ludwig; Diehl, Herbert; Eiermann, Kurt; Lamberty, Reinhold; and Nischk, Wolfgang, 4,276,143, Cl. 204-195.00M.

Nishida, Yasuhiro; and Kondo, Yasuo, to Yamaha Matsudoki Kabushiki Kaisha. Exhaust means for marine propulsion unit. 4,276,036, Cl. 440-89.000.

Nishikawa, Masao; Aoyama, Toshihiko; and Sato, Yoichi, to Honda Giken Kogyo Kabushiki Kaisha. Power steering apparatus. 4,275,798, Cl. 180-143.000.

Nishikawa, Toshio; Tamura, Sadahiro; and Ishikawa, Youhei, to Murata Manufacturing Co., Ltd. Coaxial resonator with projecting terminal portion and electrical filter employing a coaxial resonator of that type. 4,276,525, Cl. 333-206.000.

Nishikawa, Yasuhisa; and Hasumi, Ryoichi, to Clarion Co., Ltd. Push-button tuner. 4,275,606, Cl. 74-10.390.

Nishimoto, Yutaka, to Nippon Gakki Seizo Kabushiki Kaisha. Differential amplifier circuit arrangement with stabilized input impedance. 4,276,515, Cl. 330-253.000.

Nishino, Atsushi; Yoshida, Akihiko; and Ogino, Nobukuni, to Matsushita Electric Industrial Co., Ltd. Humidity sensing element of electric capacitance change type and method of producing same. 4,276,128, Cl. 204-38.00A.

Nishino, Masaki; and Yasuhara, Yutaka, to Toray Industries, Inc. 1,6,11-Undecane triisocyanate. 4,276,228, Cl. 260-453.0AL.

Nishizaki, Shinzo: *See*—
Tanimoto, Akira; Masuzawa, Sigeaki; Shibata, Shinya; and Nishizaki, Shinzo, 4,276,444, Cl. 179-1.0SM.

Nishizawa, Masahiro: *See*—
Manabe, Toshikatsu; Nonogaki, Saburo; Morishita, Hajime; Uchino, Shoichi; Tomita, Yoshifumi; Nishizawa, Masahiro; Yokomizo, Hiroshi; and Ohmatoi, Susumu, 4,276,363, Cl. 430-28.000.

Nissan Motor Company, Limited: *See*—
Abe, Fumiyuki; and Hayashi, Yoshimasa, 4,275,688, Cl. 123-41.120.
Fujishiro, Takeshi; and Ozawa, Hiroshige, 4,275,602, Cl. 73-861.220.
Fukumori, Yukitsugu; and Sone, Masazumi, 4,275,690, Cl. 123-146.50A.

Kamihama, Kiyoshi, 4,275,930, Cl. 301-37.0SS.
Kato, Yoshiaki, 4,275,477, Cl. 15-250.020.
Matsui, Katsuhiko; Kashiwaba, Yukio; and Kishimoto, Yoshioki, 4,276,161, Cl. 210-86.000.
Matsuoka, Hideoki; and Kondo, Yoshinobu, 4,275,903, Cl. 280-803.000.
Nagaishi, Hatsuo, 4,275,694, Cl. 123-463.000.
Okamoto, Shoji; and Kazama, Norio, 4,275,919, Cl. 296-214.000.
Orii, Shinichi; and Ishikawa, Masao, 4,276,581, Cl. 362-40.000.
Shibata, Kazuo, 4,275,773, Cl. 139-429.000.
Tominaga, Tamotsu; Mihara, Teruyoshi; Oguro, Takeshi; and Takeuchi, Masami, 4,276,533, Cl. 338-4.000.
Yoshikawa, Katsushi; Saito, Masaaki; Ota, Tadaki; and Inoue, Mitsumasa, 4,276,238, Cl. 261-39.00D.
Yoshikawa, Katsushi; Saito, Masaaki; Ota, Tadaki; and Inoue, Mitsumasa, 4,276,239, Cl. 261-44.00E.

Nissin Machine Works, Ltd.: *See*—
Daito, Michimasa; and Sugino, Tohru, 4,275,527, Cl. 51-103.0TF.

Niu, Joseph H. Y.: *See*—
Schmolka. Irving R.; and Niu, Joseph H. Y., 4,276,054, Cl. 44-51.000.

Noguchi, Katsuyuki: *See*—
Ikezaki, Muneyoshi; Noguchi, Katsuyuki; Iwai, Hajime; and Inamasu, Masanori, 4,276,304, Cl. 424-282.000.

Noiles, Douglas G., to United States Surgical Corporation. Coherent surgical staple array. 4,275,813, Cl. 206-339.000.

Nomax Corporation: *See*—
French, John B.; and Muttoni, Oscar E., 4,276,112, Cl. 156-360.000.

Nomura, Hirokazu: *See*—
Asai, Michihiko; Suda, Yoshio; Imada, Kiyoshi; Ueno, Susumu; and Nomura, Hirokazu, 4,276,138, Cl. 204-165.000.

Nomura, Yasushi, to Citizen Watch Company Limited. Electronic timepiece. 4,276,628, Cl. 368-85.000.

Nonogaki, Saburo: *See*—
Manabe, Toshikatsu; Nonogaki, Saburo; Morishita, Hajime; Uchino, Shoichi; Tomita, Yoshifumi; Nishizawa, Masahiro; Yokomizo, Hiroshi; and Ohmatoi, Susumu, 4,276,363, Cl. 430-28.000.

Norbeck, Dean K.: *See*—
Kountz, Kenneth J.; and Norbeck, Dean K., 4,275,987, Cl. 415-17.000.

Norman, Fielding M.: *See*—
Thacker, Charles P.; Norman, Fielding M.; and Rider, Ronald E., 4,276,647, Cl. 371-40.000.

Northern Telecom Limited: *See*—
Chowaniec, Adam, 4,276,450, Cl. 179-170.00D.

Northup, John D., to Northup, Ruth B.; Northup, John D., Jr.; Lehrkind, Nancy Northup; and Northup, Mary E., part interest to each. Method of forming glass bottles. 4,276,073, Cl. 65-77.000.

Northup, John D., Jr.: *See*—
Northup, John D., 4,276,073, Cl. 65-77.000.

Northup, Mary E.: *See*—
Northup, John D., 4,276,073, Cl. 65-77.000.

Northup, Ruth B.: *See*—
Northup, John D., 4,276,073, Cl. 65-77.000.

Norton, William W.; Stansbeary, Jack L.; Clemens, Johann; and Earl, Roscoe T., to Baxter Travenol Laboratories, Inc. Electronic injection metering and monitoring system. 4,275,480, Cl. 17-25.000.

Novinski, Edward R.; and Harrington, John H., to Metco, Inc. Self-bonding flame spray wire for producing a readily grindable coating. 4,276,353, Cl. 428-558.000.

Nowack, Gerhard P.: *See*—
Wu, Yulin; Johnson, Marvin M.; and Nowack, Gerhard P., 4,276,200, Cl. 252-443.000.

Nowacki, John J.: *See*—
Kerscher, Frederick C.; and Nowacki, John J., 4,276,261, Cl. 422-131.000.

Nowak, Milton: *See*—
Singer, William; Nowak, Milton; and Ingles, Norma, 4,276,211, Cl. 260-29.6MN.

Nyberg, Paul M.: *See*—
Chen, Gilbert K.; Nyberg, Paul M.; and Buchholz, Matthew, 4,276,242, Cl. 261-111.000.

Obara, Sanshiro; Tokuda, Hiroatsu; Konno, Akihiko; and Nakamura, Hideo, to Hitachi, Ltd. Electronic engine control apparatus having arrangement for varying fuel injection duration. 4,276,602, Cl. 364-431.000.

Obata, Shuichi; and Ito, Masashi, to Matsushita Electric Industrial Co., Ltd. Pickup cartridge and mounting device therefor. 4,276,635, Cl. 369-256.000.

Obayashi, Hideki: *See*—
Kawai, Hisasi; Egami, Tsuneyuki; Kohama, Tokio; and Obayashi, Hideki, 4,275,590, Cl. 73-204.000.

Obenour, Jerry: *See*—
Thornton, Aaron R.; and Obenour, Jerry, 4,275,744, Cl. 128-731.000.

O'Brien, Brian, Jr., to International Telephone and Telegraph Corporation. Optical fiber fabrication. 4,276,072, Cl. 65-3.00A.

O'Brien, John P.: *See*—
United States of America, National Aeronautics and Space Administration; Allcock, Harry R.; O'Brien, John P.; Scopelianos, Angelo G.; and Fewell, Larry L., 4,276,403, Cl. 528-4.000.

Occidental Chemical Company: *See*—
Gragg, F. Michael; and Self, James, 4,276,270, Cl. 423-167.000.

Occidental Petroleum Corporation: *See*—
Roeschlaub, John G.; and Hopkins, Ivan J., 4,276,155, Cl. 209-10.000.

Occidental Research Corporation: *See*—
DiGiacomo, Peter M.; and Dines, Martin B., 4,276,409, Cl. 528-362.000.
DiGiacomo, Peter M.; and Dines, Martin B., 4,276,410, Cl. 528-373.000.
DiGiacomo, Peter M.; and Dines, Martin B., 4,276,411, Cl. 528-395.000.
Gragg, F. Michael; and Self, James, 4,276,270, Cl. 423-167.000.

Oda, Terumi: *See*—
Nagano, Hiroo; Oda, Terumi; and Fukuda, Takashi, 4,276,133, Cl. 204-145.00R.

Odermann, Charles R., to Singer Company, The. Sewing machine positioning pin. 4,275,939, Cl. 312-208.000.

Ogasawara, Tsutomu; and Enomoto, Kazuo, to Fuji Xerox Co., Ltd. Security device for operation panel. 4,275,941, Cl. 312-223.000.

Ogawa, Shinsaku: *See*—
Seko, Maomi; Ogawa, Shinsaku; and Takemura, Reiji, 4,276,130, Cl. 204-98.000.

Ogawa, Yoshinari; Fukumoto, Teruhisa; and Sakai, Kohichi, to Teijin Limited. Glass fiber-reinforced thermoplastic polyester composition. 4,276,208, Cl. 260-28.00R.

Ogino, Nobukuni: *See*—
Nishino, Atsushi; Yoshida, Akihiko; and Ogino, Nobukuni, 4,276,128, Cl. 204-38.00A.

Ogirima, Masahiko: *See*—
Takano, Yukio; Ogirima, Masahiko; Aoki, Shigeru; Maki, Michiyoshi; and Kato, Shigeo, 4,276,114, Cl. 156-645.000.

Oguro, Takeshi: *See*—
Tominaga, Tamotsu; Mihara, Teruyoshi; Oguro, Takeshi; and Takeuchi, Masami, 4,276,533, Cl. 338-4.000.

Ohara, Isamu; Muranaka, Tsutomu; and Eizumi, Hideo, to Omron Tateisi Electronics Co. Electric motor-driven timer. 4,276,528, Cl. 335-75.000.

Ohashi, Toshiro: *See*—
Fujita, Teizo; Ohashi, Toshiro; and Takimoto, Kouji, 4,276,631, Cl. 368-89.000.

Ohio State University, The: *See*—
Gilson, Richard D.; Thurston, Marlin O.; Olson, Karl W.; and Ventola, Ronald W., 4,276,029, Cl. 434-43.000.

Ohlschlager, Hans; Rosenhahn, Lothar; and Sauerteig, Wolfgang, to AGFA-Gevaert, A.G. Photosensitive photographic material containing a light-absorbing dye. 4,276,373, Cl. 430-507.000.

Ohmatoi, Susumu: *See*—
Manabe, Toshikatsu; Nonogaki, Saburo; Morishita, Hajime; Uchino, Shoichi; Tomita, Yoshifumi; Nishizawa, Masahiro; Yokomizo, Hiroshi; and Ohmatoi, Susumu, 4,276,363, Cl. 430-28.000.

Ohmichi, Hitoshi: *See*—
Enomoto, Hiromu; Yasuda, Yasushi; Ohmichi, Hitoshi; and Mitono, Yoshiharu, 4,276,556, Cl. 357-52.000.

Ohtani, Shigemori: *See*—
Takeyama, Toshiro; and Ohtani, Shigemori, 4,275,841, Cl. 239-431.000.

Ohtsubo, Yoshiaki: *See*—
Watanabe, Sakuji; Ohtsubo, Yoshiaki; and Toyoda, Kenji, 4,275,953, Cl. 354-33.000.

Oka, Hitoshi; and Nakamura, Kenji, to Hitachi, Ltd. Process for controlling of chemical copper plating solution. 4,276,323, Cl. 427-8.000.

Okabe, Yukio: *See*—
Watanabe, Yasuaki; Okabe, Yukio; Kojima, Shinichi; and Sato, Mitsuya, 4,276,560, Cl. 358-28.000.

Okada, Motohiro, to Honda Giken Kogyo Kabushiki Kaisha. Inflatable safety bag system for vehicles. 4,275,901, Cl. 280-741.000.

Okamoto, Eiichi; Fujisawa, Norio; and Hori, Masao, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and apparatus for supervising a digital protective relaying system. 4,276,605, Cl. 364-483.000.

Okamoto, Shoji; and Kazama, Norio, to Nissan Motor Company, Limited. Suspension-type head lining arrangement for automotive vehicle and clip element for use therein. 4,275,919, Cl. 296-214.000.

Okawa, Tadashi; Honbu, Mitsuyuki; Matsuda, Yasuo; Shibata, Takanori; and Kawaguchi, Toshio, to Hitachi, Ltd. Twelve-step current source inverter. 4,276,589, Cl. 363-71.000.

Okazawa, Yukio: *See*—
Mouri, Takenori; Morimoto, Kengi; Yoshimoto, Itaru; Kayama, Hiroyki; Okazawa, Yukio; and Sizukuisi, Touru, 4,275,648, Cl. 99-483.000.

Okubo, Kiyokazu; and Nakayama, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for preventing wrong shift operation in speed change gear for vehicle. 4,275,614, Cl. 74-476.000.

Okumoto, Kiyofumi: *See*—
Hashimoto, Takeji; Okumoto, Kiyofumi; and Andoh, Masayasu, 4,275,573, Cl. 66-75.200.

Okuyama, Toshiaki: *See*—
Nagase, Hiroshi; Okuyama, Toshiaki; and Kubota, Yuzuru, 4,276,504, Cl. 318-721.000.

Olander, Walter K.: *See*—
Markezich, Ronald L.; Olander, Walter K.; and Axelrod, Robert J., 4,276,233, Cl. 260-937.000.

Olin Corporation: *See*—
Popplewell, James M.; and Butt, Sheldon H., 4,275,784, Cl. 165-134.00R.
Saeman, Walter C., 4,276,349, Cl. 428-403.000.

Olivotto, Vanfrido, to Olivotto Vetromeccanica S.a.s. Machine for the manufacture of glass articles by blow moulding glass. 4,276,075, Cl. 65-160.000.

Olivotto Vetromeccanica S.a.s.: *See*—
Olivotto, Vanfrido, 4,276,075, Cl. 65-160.000.

Olson, Donald O. Combination stabilizer and sprinkler support for surface hose. 4,275,839, Cl. 239-272.000.

Olson, Karin S. B., to Landstingens Inkopscentral Lic, Ekonomisk Forening. Vein catheter bandage. 4,275,721, Cl. 128-133.000.

Olson, Karl W.: *See*—
Gilson, Richard D.; Thurston, Marlin O.; Olson, Karl W.; and Ventola, Ronald W., 4,276,029, Cl. 434-43.000.

Omron Tateisi Electronics Co.: *See*—
Inoue, Haruhiko; and Nakano, Syuji, 4,276,598, Cl. 364-405.000.
Ohara, Isamu; Muranaka, Tsutomu; and Eizumi, Hideo, 4,276,528, Cl. 335-75.000.

Onishi, Hisao: *See*—
Sakimae, Akihiro; and Onishi, Hisao, 4,276,381, Cl. 435-179.000.

Onoye, Hideo: *See*—
Kitamura, Masatsugu; Onoye, Hideo; and Yamazaki, Masami, 4,276,604, Cl. 364-480.000.

Oosterling, Pieter A.; and van Staveren, Hendricus C., to Multinorm, B.V. Mowing device. 4,275,547, Cl. 56-13.600.

Opalka, Chester J., Jr.: *See*—
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,276,293, Cl. 424-248.400.

Opitz, Wolfgang: *See*—
Etschenberg, Eugen; Opitz, Wolfgang; and Raddatz, Siegfried, 4,276,288, Cl. 424-177.000.

Optsonic Research Associates, Inc.: *See*—
Horn, Michael, 4,275,596, Cl. 73-607.000.

Orals, David L.; and Bushey, Peter S., to United States Gypsum Company. Fire resistant floor and ceiling assembly. 4,275,541, Cl. 52-483.000.

Orii, Shinichi; and Ishikawa, Masao, to Nissan Motor Company, Limited. Headlight tilting system for vehicles. 4,276,581, Cl. 362-40.000.

Orlowski, Gerald J.; Wicklund, Rodney D.; Sandlas, Richard D.; and Weibler, Walter W., to Armour and Company. Apparatus and method for molding meat patties. 4,276,318, Cl. 426-513.000.

Ornstein, Leonard: *See*—
Adler, Stanford L., Sr.; Gordon, Abraham; and Ornstein, Leonard, 4,276,253, Cl. 264-247.000.

Ortho Pharmaceutical Corporation: *See*—
Hajos, Zoltan G.; and Wachter, Michael P., 4,276,216, Cl. 260-340.600.

Oshima, Ryoichiro: *See*—
Kuroda, Michio; Nakamura, Shozo; Tsukahara, Satoshi; Akatu, Yasuaki; Sugita, Shigehisa; Kaneko, Kojiro; Sakaguchi, Seiichiro; and Oshima, Ryoichiro, 4,275,563, Cl. 60-673.000.

Osumi, Kazuoki: *See*—
Yukawa, Hideaki; Osumi, Kazuoki; Nara, Terukazu; and Takayama, Yoshihiro, 4,276,380, Cl. 435-115.000.

Ota, Tadaki: *See*—
Yoshikawa, Katsushi; Saito, Masaaki; Ota, Tadaki; and Inoue, Mitsumasa, 4,276,238, Cl. 261-39.00D.
Yoshikawa, Katsushi; Saito, Masaaki; Ota, Tadaki; and Inoue, Mitsumasa, 4,276,239, Cl. 261-44.00E.

Otis Engineering Corporation: *See*—
Crockett, Emmet E., 4,276,482, Cl. 290-52.000.

Ott, Karl-Heinz: *See*—
Hardt, Dietrich; Humme, Gert; Ott, Karl-Heinz; and Braese, Hans-Eberhard, 4,276,391, Cl. 525-71.000.

Otthofer, Jacob A., Jr., to Armstrong World Industries, Inc. Expandable mandrel. 4,276,148, Cl. 204-281.000.

Outboard Marine Corporation: *See*—
Kashmerick, Gerald E., 4,276,034, Cl. 440-75.000.

Outland, Robert J., to General Motors Corporation. Ceramic filters for diesel exhaust particulates. 4,276,071, Cl. 55-523.000.

Outlaw, Homer G. Winter jersey with hand warmer. 4,275,468, Cl. 2-115.000.

Overall, Colin D.: *See*—
Stone, Henry D.; Knapp, Alan G.; Mansell, John R.; Overall, Colin D.; and Washington, Derek, 4,276,127, Cl. 204-24.000.

Overall, John C. K.: *See*—
Schaus, Orland O.; and Overall, John C. K., 4,275,705, Cl. 126-110.00R.

Ovodenko, Alexandr V.: *See*—
Stakhov, Alexei P.; Solyanichenko, Nikolai A.; Luzheisky, Vladimir A.; Ovodenko, Alexandr V.; and Kozak, Andrei A., 4,276,608, Cl. 364-768.000.

Owen, Geoffrey R.: *See*—
Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., 4,276,301, Cl. 424-273.00R.

Owens-Corning Fiberglas Corporation: *See*—
Ault, Russell L., 4,276,245, Cl. 264-46.500.

Owens, Robert L.: *See*—
Ciarcia, Ronald D.; and Owens, Robert L., 4,276,526, Cl. 335-35.000.

Ozawa, Hiroshige: *See*—
Fujishiro, Takeshi; and Ozawa, Hiroshige, 4,275,602, Cl. 73-861.220.

P.I.V. Antrieb Werner Reimers Kommanditgesellschaft: *See*—
Steuer, Herbert K., 4,276,041, Cl. 474-243.000.

Pabodie, Robert M.: *See*—
Hamisch, Paul H., Jr.; and Pabodie, Robert M., 4,275,654, Cl. 101-110.000.

PACCAR Inc.: *See*—
Henneman, Richard C.; Burdon, Kenneth A.; and Bruce, Joseph R., 4,275,870, Cl. 254-361.000.

Pace, Dan R. Kelp blade harvester. 4,275,545, Cl. 56-8.000.

Pacific Marine Electronics, Inc.: *See*—
Nations, William N.; and Kerwin, Kenneth H., II, 4,276,654, Cl. 455-160.000.

Padley, Frederick B.; Paulussen, Cornelis N.; Soeters, Cornelis; and Tresser, David, to Lever Brothers Company. Chocolate having defined hard fat. 4,276,322, Cl. 426-660.000.

Page, Donald F.: *See*—
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,276,293, Cl. 424-248.400.

Paint Brush Holder Company, The: *See*—
Church, Robert F., 4,275,818, Cl. 220-90.000.

Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., to Stauffer Chemical Company. Herbicide compositions. 4,276,078, Cl. 71-88.000.

Palumbo, Kenneth S.: *See*—
Bell, George E.; Wilson, Clement B.; Thibado, Daniel H.; and Palumbo, Kenneth S., 4,275,956, Cl. 355-3.0DD.

Panpack A.G.: *See*—
Staar, Marcel J. H., 4,275,840, Cl. 239-327.000.

Paratte, Daniel, to Fabrique d'Horlogerie de Fontainemelon S.A. Electronic watch movement. 4,276,630, Cl. 368-88.000.

Parenti, Francesco; Coronelli, Carolina; Tamoni, Giorgio; and Lancini, Giancarlo, to Gruppo Lepetit S.p.A. Antibiotic substances. 4,276,382, Cl. 435-253.000.

Park Mobile, Inc.: *See*—
Lichti, Robert D.; and Hock, Frederick D., 4,275,979, Cl. 414-251.000.

Parker, Denson. Fluid velocity actuated structure for a wind mill/water wheel. 4,276,481, Cl. 290-43.000.

Parker-Hannifin Corporation: *See*—
Belofsky, Harold, 4,275,937, Cl. 308-127.000.
Woodring, Richard H.; Whitmore, Charles H.; Houtman, Paul K.; and Kowalski, Thomas A., 4,275,997, Cl. 417-218.000.

Parker, Jimmy J.: *See*—
Ryan, Edward C.; and Parker, Jimmy J., 4,276,037, Cl. 474-70.000.

Parker, John A.: *See*—
Varma, Indra K.; Fohlen, George M.; Parker, John A.; and Frosch, Robert A., 4,276,344, Cl. 428-260.000.

Parker, Robert P., to RCA Corporation. Circuit for inhibiting radio frequency interference in a television receiver. 4,276,566, Cl. 358-170.000.

Parkinson, Martin; and Dimitroff, Michael V., to Bio-Vac Incorporated. Evaporator/sublimator flask apparatus. 4,275,511, Cl. 34-92.000.

Partus, Fred P., to Western Electric Company, Inc. Vapor delivery control system and method. 4,276,243, Cl. 261-128.000.

Pasic, Hajrudin; and Herrmann, George, to Electric Power Research Institute, Inc. Method of removing particulate matter from precipitator plate. 4,276,056, Cl. 55-13.000.

Pasternack, Adalbert: *See*—
Warncke, Ernst; and Pasternack, Adalbert, 4,275,723, Cl. 128-202.220.

Pastorino, Ronald L.: *See*—
Muenchow, John R.; Pastorino, Ronald L.; Halle, Reidar; and Lewis, Roger N., 4,276,247, Cl. 264-54.000.

Patel, Gordhanbhai N., to Allied Chemical Corporation. Process for monitoring time-temperature histories of perishables utilizing inactive form of diacetylene. 4,276,190, Cl. 252-408.000.

Patel, Narendra M., to NCR Corporation. CCD memory retrieval system. 4,276,609, Cl. 364-900.000.

Patton, John S., to Ethyl Corporation. Safety closure and container combination. 4,275,817, Cl. 215-217.000.

Pauli, Balduin L., to Warmetechnik Dr. Pauli GmbH & Co. Betriebs KG. Air-cooled grate bar. 4,275,706, Cl. 126-163.00R.

Paulussen, Cornelis N.: *See*—
Padley, Frederick B.; Paulussen, Cornelis N.; Soeters, Cornelis; and Tresser, David, 4,276,322, Cl. 426-660.000.

Pavlov, Jury M.: *See*—
Zaets, Inna I.; Davydenko, Nikolai M.; Yakshina, Olga K.; Pershina, Nina F.; Demyanenko, Valentina D.; and Pavlov, Jury M., 4,276,088, Cl. 106-1.120.

Pearson, John E.: *See*—
Jarvis, Clifford W.; and Pearson, John E., 4,276,545, Cl. 340-545.000.

Pechiney Ugine Kuhlmann: *See*—
Hue, Bernard P. H.; and Mercier, Henri A., 4,276,327, Cl. 427-345.000.

Pedersen, Alec, to Pedersen Industries Ltd. Mononose conversion for twinskis. 4,275,904, Cl. 280-818.000.

Pedersen Industries Ltd.: *See*—
Pedersen, Alec, 4,275,904, Cl. 280-818.000.

Peerless Machinery Corporation: *See*—
Zielsdorf, Franklin J., 4,275,568, Cl. 62-342.000.

Peglan, Manfred: *See*—
Steinbrecher, Heinrich; Koch Johannes; and Peglan, Manfred, 4,275,578, Cl. 72-14.000.

Peiffert, Jean; and Barbedienne, Roger S. Method and apparatus for servo-controlling a rotating workpiece. 4,276,503, Cl. 318-576.000.

Pennington, John W., III; and Thorsted, Kenneth G., to United States of America, Navy. Anchoring system. 4,275,680, Cl. 114-295.000.

Pennsylvania Engineering Corporation: *See*—
Nagati, Rashed N., 4,275,871, Cl. 266-243.000.

Pennwalt Corporation: *See*—
Bonn, John W., 4,275,566, Cl. 62-55.500.
Miano, Jeffrey D.; and Sandler, Stanley R., 4,276,387, Cl. 521-167.000.
Perez, Sergio J. Twenty cigarette dispenser. 4,275,819, Cl. 221-186.000.
Perkey, Russell C.; Thoman, David C.; and Eastman, James M., to Bendix Corporation, The. System for cooling motor bearings. 4,276,006, Cl. 418-94.000.
Perkin-Elmer Corporation, The: *See*—
Hansel, Allen B.; and Natarajan, Thiagarajan, 4,276,590, Cl. 363-71.000.
Quick, Donald L., 4,276,591, Cl. 363-92.000.
Perkins, Gerald S.; and Moore, Nicholas R., to California Institute of Technology. Reciprocating piston pump system with screw drive. 4,276,003, Cl. 417-415.000.
Perkins, Patrick: *See*—
Vollhardt, Kurt P. C.; and Perkins, Patrick, 4,276,395, Cl. 525-332.000.
Perry, George J.: *See*—
Kuehnle, Manfred R.; and Perry, George J., 4,275,957, Cl. 355-10.000.
Pershina, Nina F.: *See*—
Zaets, Inna I.; Davydenko, Nikolai M.; Yakshina, Olga K.; Pershina, Nina F.; Demyanenko, Valentina D.; and Pavlov, Jury M., 4,276,088, Cl. 106-1.120.
Perzley, William: *See*—
Engelberger, Joseph F.; Lindbom, Torsten H.; Dunne, Maurice J.; Perzley, William; Roberts, Wilbur N.; and Gardner, Horace L., 4,275,986, Cl. 414-730.000.
Petersen, Harro; Krause, Hans-Joachim; Fischer, Kurt; Segnitz, Adolph; and Zaunbrecher, Horst, to BASF Aktiengesellschaft. Cocondensates based on phenol-butyraldehyde resins, their preparation and their use. 4,276,209, Cl. 260-28.00P.
Petershack, Victor D., to Rexnord Inc. Pintle chain having extended wear barrel section and sprocket therefor. 4,276,040, Cl. 474-229.000.
Peterson, Donald L.; Srivastava, Ajit K.; and Brown, Galen K., to United States of America, Agriculture. Mechanical buncher for leafy vegetables. 4,275,649, Cl. 100-4.000.
Peterson, James G.: *See*—
Miller, Ralph W.; and Peterson, James G., 4,276,543, Cl. 340-347.0AD.
Peterson, William R., Jr.; and Arkles, Barry C., to Petrarch Systems. Methods for the production of organic polysilanes. 4,276,424, Cl. 556-430.000.
Petersson, Ralf C. E., to Sundins Fabriker AB. Piston pump. 4,275,998, Cl. 417-269.000.
Petrarch Systems: *See*—
Peterson, William R., Jr.; and Arkles, Barry C., 4,276,424, Cl. 556-430.000.
Petrolite Corporation: *See*—
Quinlan, Patrick M., 4,276,291, Cl. 424-246.000.
Quinlan, Patrick M., 4,276,416, Cl. 544-58.200.
Petryk, Edward M., Jr., to Honeywell Information Systems Inc. Apparatus and method for replacement of a parallel, computer-to-peripheral wire link with a serial optical link. 4,276,656, Cl. 455-608.000.
Pfefferle, William C., to Acurex Corporation. Catalytic system and process for producing it. 4,276,203, Cl. 252-462.000.
Pfizer Inc.: *See*—
Andrews, Glenn C., 4,276,219, Cl. 260-343.700.
Barth, Wayne E., 4,276,285, Cl. 424-114.000.
Lipinski, Christopher A., 4,276,297, Cl. 424-263.000.
Wilson, David M., 4,276,183, Cl. 428-480.000.
Philippe, David: *See*—
Gelardi, Anthony; Gelardi, Paul; Swinburne, Stephen; Janiszewski, Michael; MacLeod, Robert, Jr.; Philippe, James; and Philippe, David, 4,275,943, Cl. 312-319.000.
Philippe, James: *See*—
Gelardi, Anthony; Gelardi, Paul; Swinburne, Stephen; Janiszewski, Michael; MacLeod, Robert, Jr.; Philippe, James; and Philippe, David, 4,275,943, Cl. 312-319.000.
Phillips, Earl G.; and Ranger, Dee B., to Stryker Corporation. Fluid flow control console. 4,276,023, Cl. 433-85.000.
Phillips, Emyr: *See*—
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Phillips Petroleum Company: *See*—
Dixon, Rolland E.; and Chapman, Charles C., 4,276,257, Cl. 422-62.000.
Eddy, William R.; and Taylor, Raymond C., 4,276,043, Cl. 493-160.000.
Hutson, Thomas, Jr.; Makovec, Donald J.; and Beckworth, Alden E., 4,276,439, Cl. 585-720.000.
Selman, Charles M.; and Fodor, Lawrence M., 4,276,192, Cl. 252-429.00B.
Wu, Yulin; Johnson, Marvin M.; and Nowack, Gerhard P., 4,276,200, Cl. 252-443.000.
Wu, Yulin, 4,276,223, Cl. 260-348.160.
Phillips, Thomas R., to Du Pont de Nemours, E. I., and Company. Polyvinyl butyral plasticized with tetraethyleneglycol di-2-ethylhexanoate. 4,276,351, Cl. 428-437.000.
Piber, Earl T., to Eaton Corporation. Adjustable trigger stop. 4,276,461, Cl. 200-329.000.
Pickermann, Otto. Asphalt production. 4,276,093, Cl. 106-281.00R.
Picquet, Pierre C.: *See*—
Welsh, Jay Y.; Mullier, Alain; and Picquet, Pierre C., 4,276,268, Cl. 423-49.000.
Pinson, Neal I., to Tension Structures, Inc. Tension members. 4,275,537, Cl. 52-223.00R.
Plank, Charles J.; Rosinski, Edward J.; and Givens, Edwin N., to Mobil Oil Corporation. Novel reforming catalysts. 4,276,151, Cl. 208-138.000.
Plastic Auvergne: *See*—
Combronde, Roger, 4,276,254, Cl. 264-251.000.
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Shartzer, Kenneth B., 4,276,010, Cl. 425-143.000.
Platt Saco Lowell Limited: *See*—
Tarbon, Philip B.; and Martin, Charles R., 4,275,554, Cl. 57-263.000.
Poclain: *See*—
Moro, Christian D.; and Ranini, Daniel G., 4,275,542, Cl. 52-731.000.
Pohl, Lothar, to Wisco Corporation. Sliding roof panel. 4,275,920, Cl. 296-222.000.
Pohler, Friedmar; Falk, Hans; Muller, Josef; Klein, Hans J.; and Hofacker, Franz, to AGFA-Gevaert, A.G. Method for the contact-free continuous measurement and monitoring of magnetic tracks on moving film strips. 4,276,324, Cl. 427-10.000.
Poirier, Jean B. Mattress. 4,275,473, Cl. 9-13.000.
Polaroid Corporation: *See*—
Gutoff, Edgar B., 4,275,587, Cl. 73-64.400.
Taylor, Lloyd D., 4,276,370, Cl. 430-466.000.
Polymerics, Inc.: *See*—
Lester, David; and Alexander, Robert, 4,276,207, Cl. 260-17.00R.
Poncy, George W.: *See*—
Poncy, Mark P.; Poncy, George W.; and Poncy, Richard P., 4,275,812, Cl. 206-278.000.
Poncy, Mark P.; Poncy, George W.; and Poncy, Richard P. Surgical glove package and donning method. 4,275,812, Cl. 206-278.000.
Poncy, Richard P.: *See*—
Poncy, Mark P.; Poncy, George W.; and Poncy, Richard P., 4,275,812, Cl. 206-278.000.
Popplewell, James M.; and Butt, Sheldon H., to Olin Corporation. Fail safe heat exchanger. 4,275,784, Cl. 165-134.00R.
Porta, Augusto; and Mosetti, Jacques, to Dow Chemical Company, The. Method for removing chlorate from caustic solutions with electrolytic iron. 4,276,134, Cl. 204-153.000.
Porter, Kenneth, to Imperial Chemical Industries Limited. Laying oriented fibrous webs. 4,276,106, Cl. 156-181.000.
Porter, William H., to W. H. Porter, Inc. Hexagonal building structures. 4,275,534, Cl. 52-82.000.
Post Office, The: *See*—
Beales, Keith J.; Duncon, William J.; Dunn, Anthony G.; and Newns, George R., 4,275,951, Cl. 350-96.310.
Postupack, Dennis S.; and Allerton, David A., to PPG Industries, Inc. Method for supporting flexible sheet while applying graded shade band thereon. 4,276,325, Cl. 427-14.100.
Powell, David R.: *See*—
Laprie, Jean-Claude; Powell, David R.; Alcouffe, Gerard; and Romand, Paul, 4,276,643, Cl. 371-8.000.
PPG Industries Canada Ltd.: *See*—
Geesen, Donald H., 4,276,117, Cl. 159-47.00R.
PPG Industries, Inc.: *See*—
Bryant, Lovell D.; and Koontz, Harry S., 4,276,509, Cl. 324-51.000.
Franz, Helmut, 4,276,350, Cl. 428-410.000.
Postupack, Dennis S.; and Allerton, David A., 4,276,325, Cl. 427-14.100.
Shuster, James S., 4,276,074, Cl. 65-106.000.
Prakla - Seismos GmbH: *See*—
Helbig, Klaus, 4,275,787, Cl. 166-251.000.
Prato Commerz, S.p.A.: *See*—
Maranghi, Marco, 4,276,345, Cl. 428-284.000.
Primbsch, Erik, to Krautkramer-Branson, Inc. Method and apparatus for sensing ultrasonic energy. 4,275,963, Cl. 356-35.500.
Prince Corporation: *See*—
Marcus, Konrad H., 4,275,913, Cl. 296-37.100.
Marcus, Konrad H., 4,275,917, Cl. 296-97.00R.
Skogler, Brian I., 4,275,916, Cl. 296-97.00H.
Procter & Gamble Company, The: *See*—
Ferry, Merle W., 4,276,205, Cl. 252-528.000.
Kirby, Charles E., 4,276,227, Cl. 260-425.000.
Ludwa, Raymond J.; Forry, Mark E.; and Haugen, Marilyn M., 4,276,338, Cl. 428-137.000.
Reller, Herbert H.; and Kretschmar, Herbert C., 4,276,430, Cl. 560-66.000.
Produits Chimiques Ugine Kuhlmann: *See*—
Aguinet, Gerard; Le Bras, Andre; Manoury, Jean; and Martin, Edouard, 4,276,277, Cl. 423-393.000.
Proett, Mark A.: *See*—
Speer, Howard D., Jr.; and Proett, Mark A., 4,275,500, Cl. 30-40.000.
Przybyla, Bernd: *See*—
Bauer, Hartmut; Schmidt, Peter; Stocker, Herbert; and Przybyla, Bernd, 4,275,695, Cl. 123-486.000.
Puchalski, Chester: *See*—
Brown, Richard E.; Puchalski, Chester; and Shavel, John, Jr., 4,276,296, Cl. 424-256.000.
Pufahl, Joseph. Adhesive-coated impregnated polyurethane foam. 4,276,107, Cl. 156-238.000.
Purton, Robert M.; and Hanson, Lloyd D., to Dresser Industries, Inc. Decoking nozzle assembly. 4,275,842, Cl. 239-446.000.
Putney, Gordon A., to Harnischfeger Corporation. Load brake. 4,275,803, Cl. 188-134.000.

Quantel S.A.: *See—*
Marteau, Jean M., 4,276,519, Cl. 331-94.50C.

Quedens, Phillipp J.; Haverl, Ronald A.; and Stoller, Milton, to Smith-Kline Instruments. Inc. Ultrasonic beam scanning technique and apparatus. 4,275,597, Cl. 73-618.000.

Quick, Donald L., to Perkin-Elmer Corporation, The. Programmable power regulating power supply. 4,276,591, Cl. 363-92.000.

Quick, Thomas H., to Weyerhaeuser Company. Deinking waste electrophotography copy paper. 4,276,118, Cl. 162-5.000.

Quinlan, Patrick M., to Petrolite Corporation. Tertiary amino-substituted thiazines. 4,276,291, Cl. 424-246.000.

Quinlan, Patrick M., to Petrolite Corporation. Quaternaries of tertiary amino-substituted thiazines. 4,276,416, Cl. 544-58.200.

Racor Industries, Inc.: *See—*
Wilson, Michael, 4,276,162, Cl. 210-94.000.

Raddatz, Siegfried: *See—*
Etschenberg, Eugen; Opitz, Wolfgang; and Raddatz, Siegfried, 4,276,288, Cl. 424-177.000.

Radice, John G., to Doron Precision Systems, Inc. Pivotable vehicle simulator. 4,276,030, Cl. 434-62.000.

Rady, Bruce A.; Wells, Thomas R.; and Hendrickson, Kenneth, to Bell & Howell Company. Bar code reader. 4,276,470, Cl. 235-463.000.

Ragavan, Soman; and Spector, George. System gas alarm. 4,275,681, Cl. 116-70.000.

Rahdener Maschinenfabrik August Kolbus: *See—*
Rathert, Horst, 4,275,873, Cl. 270-54.000.

Ralston Purina Company: *See—*
Nguyen, Thanh V.; and Wagner, Thomas J., 4,276,319, Cl. 426-574.000.

Ramuz, Henri: *See—*
Muller, Jean-Claude; and Ramuz, Henri, 4,276,417, Cl. 544-198.000.

Randell, Donald R.; and Phillips, Emyr, to Ciba-Geigy Corporation. Anthraquinone sulphonamide compounds and preparation. 4,276,224, Cl. 260-371.000.

Ranger, Dee B.: *See—*
Phillips, Earl G.; and Ranger, Dee B., 4,276,023, Cl. 433-85.000.

Ranini, Daniel G.: *See—*
Moro, Christian D.; and Ranini, Daniel G., 4,275,542, Cl. 52-731.000.

Ranke, Gerhard: *See—*
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Ransburg Corporation: *See—*
Fangmeyer, Dennis L., 4,275,838, Cl. 239-223.000.

Rao, T. R. N.: *See—*
Haggard, Roger L.; Seitchik, Jerold A.; and Rao, T. R. N., 4,276,646, Cl. 371-37.000.

Rapp, Walter: *See—*
Schnegg, Peter; Rapp, Walter; and Vosteen, Bernhard, 4,276,431, Cl. 560-67.000.

Rasberger, Michael, to Ciba-Geigy Corporation. Phosphorus stabilizers. 4,276,232, Cl. 260-936.000.

Rathert, Horst, to Rahdener Maschinenfabrik August Kolbus. Process and equipment for the opening of folded proof sheets. 4,275,873, Cl. 270-54.000.

Ratzlaff, Howard L.: *See—*
Swenson, Edward L.; and Ratzlaff, Howard L., 4,275,550, Cl. 56-341.000.

Ray, Earl L. Internal combustion engine. 4,275,689, Cl. 123-53.00B.

Raychem Corporation: *See—*
Middleman, Lee M.; and Goodrich, Roger S., 4,276,466, Cl. 219-523.000.

Raytheon Company: *See—*
Le, Hiep T., 4,276,617, Cl. 365-189.000.

RCA Corporation: *See—*
Goldman, Michael B.; and Morton, George I., 4,276,592, Cl. 363-147.000.
Hubert, Carl H., 4,275,861, Cl. 244-165.000.
Parker, Robert P., 4,276,566, Cl. 358-170.000.

Rea, James H.: *See—*
Karim, Khalid A.; and Rea, James H., 4,276,111, Cl. 156-308.200.

Rebours, Albert: *See—*
Remillieux, Jean; Rebours, Albert; Dumortier, Philippe; and Marchal, Paul H. L., 4,276,019, Cl. 432-1.000.

Reddy, Redreddy S., to Vapor Corporation. Step-platform operation. 4,275,664, Cl. 105-430.000.

Redikultsev, Jury V.; Shkidchenko, Alexandr N.; Gorbunov, Oleg P.; and Litvinenko, Leonid A. Device for sterilizing liquid media by steam. 4,276,264, Cl. 422-307.000.

Regie Nationale des Usines Renault: *See—*
Fanz, Helmut, 4,276,501, Cl. 318-470.000.

Rehkopf, John W. Automatic holding device for gasoline pump handles. 4,275,776, Cl. 141-392.000.

Rehm, Stephen J.: *See—*
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Reimer-Nielsen, Ib: *See—*
Andersen, Jorgen; and Reimer-Nielsen, Ib, 4,275,774, Cl. 141-1.000.

Reinhardt, Paul A.: *See—*
Beimgraben, Herbert W.; and Reinhardt, Paul A., 4,275,795, Cl. 175-26.000.

Reinink, Jan: *See—*
Engelhardt, Manfred; Reinink, Jan; De Vries, Jochem J.; Trees, Ferdinand M.; Tietjens, Eduard W.; and Groothuis, Gerrit J., 4,275,497, Cl. 30-43.600.

Reinke, George W.: *See—*
Artaud, Gerard P.; Schrader, Clarence O.; and Reinke, George W., 4,275,655, Cl. 101-123.000.

Reinsma, Harold L., to Caterpillar Tractor Co. Seal with stiffened force-transmitting portion. 4,275,890, Cl. 277-84.000.

Rekers, Louis J.; and Speca, Anthony N., to National Petro Chemicals Corp. Supported catalyst from chromium for olefin polymerization. 4,276,399, Cl. 526-106.000.

Reller, Herbert H.; and Kretschmar, Herbert C., to Procter & Gamble Company, The. Analgesic and anti-inflammatory compounds and compositions containing same. 4,276,430, Cl. 560-66.000.

Remillieux, Jean; Rebours, Albert; Dumortier, Philippe; and Marchal, Paul H. L., to Air Industrie. Process for regenerating of an adsorbing material in the form of particles charged with at least two volatile compounds having different thermal stabilities. 4,276,019, Cl. 432-1.000.

Repco Limited: *See—*
Molnar, Thomas G., 4,275,923, Cl. 297-250.000.

Reppert, Merlyn R., to W. R. Grace & Co. Offset wire wheel. 4,275,931, Cl. 301-37.00R.

Repwell Associates, Inc.: *See—*
Bothwell, Bruce E., 4,276,331, Cl. 428-36.000.

Research Technology, Inc.: *See—*
Bowen, Howard; and Little, John S., 4,276,547, Cl. 340-675.000.

Rexnord Inc.: *See—*
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Reynolds, James E.; and Williams, Alan R., to Hazen Research, Inc. Hydrometallurgical process for the recovery of lead. 4,276,084, Cl. 75-101.00R.

Rhum, David; and Aluotto, Patrick F., to Celanese Corporation. Low molecular weight acrylates or methacrylates and methods for their preparation. 4,276,432, Cl. 560-190.000.

Richards, Les W. Method and system for cooling a mold. 4,275,864, Cl. 249-79.000.

Richardson, John A.: *See—*
Drbal, Vladimir J.; Ginsberg, Guenter; Hodgins, Bruce J.; Richardson, John A.; Britton, Ted W.; Grimm, Richard M.; Bello, Ernesto; Rodriguez, Rodolfo R.; and Saltz, Ivan K., 4,276,260, Cl. 422-100.000.

Richmond Tank Car Company: *See—*
Adler, Franklin P.; and Starks, Marvin, 4,275,662, Cl. 105-377.000.

Richter, Fred T.: *See—*
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Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
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Richter, Johan C. F. C.; and Richter, Ole J., to Kamyr Aktiebolag. Diffuser arrangements. 4,276,167, Cl. 210-331.000.

Richter, Ole J.: *See—*
Richter, Johan C. F. C.; and Richter, Ole J., 4,276,167, Cl. 210-331.000.

Rickenbacker, James E., to Exxon Production Research Company. Impedance and common mode rejection testing of a multi-channel seismic data gathering apparatus. 4,276,619, Cl. 367-13.000.

Ricoh Company, Ltd.: *See—*
Matsuhisa, Koh; and Takezawa, Mamoru, 4,275,969, Cl. 400-625.000.

Rider, Ronald E.: *See—*
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Rieckeheer, Rainer: *See—*
Heinzerling, Jurgen; and Rieckeheer, Rainer, 4,276,529, Cl. 335-300.000.

Riedel, Tilo, to Sesamat Anstalt. Cleated snow chain. 4,275,781, Cl. 152-224.000.

Riedle, Rudolf: *See—*
Lindner, Tassilo; Zeller, Norbert; Frey, Volker; Riedle, Rudolf; John, Peter; and Engelsberger, Georg, 4,276,426, Cl. 556-479.000.

Riggs, E. Gray; Simmonds, Joseph K.; and Browning, Vernon D. Reinforced hose having embedded indicia strip. 4,275,768, Cl. 138-104.000.

Riggs, Robert S., to Goodyear Tire & Rubber Company, The. Transfer drum application of narrow strip components to a tire being built on a tire building drum. 4,276,104, Cl. 156-123.00R.

Rimmer, Norman L.: *See—*
Denton, John B.; Dale, John G.; and Rimmer, Norman L., 4,275,816, Cl. 211-68.000.

Risdon Enterprises, Inc.: *See—*
Sullivan, William E.; and Meetze, Murray O., Jr., 4,276,236, Cl. 261-30.000.

Risman, Per O., to Husqvarna Aktiebolag. Microwave heating apparatus. 4,276,462, Cl. 219-10.55F.

Rivenburgh, Dennis L.: *See—*
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Riveros, Carlos A. Method and apparatus for controlling current in inductive loads such as large diameter coils. 4,276,484, Cl. 307-104.000.

Robbins, Melvin E., to Davey Compressor Co. Mobile heater. 4,276,018, Cl. 431-352.000.

Roberson, James H. Control apparatus for a carding machine. 4,275,483, Cl. 19-240.000.

Robert Bosch GmbH: *See—*
Bauer, Hartmut; Schmidt, Peter; Stocker, Herbert; and Przybyla, Bernd, 4,275,695, Cl. 123-486.000.

Bodig, Bernd; Roozenbeek, Herman; and Jundt, Werner, 4,275,703, Cl. 123-617.000.
Foerster, Hubert; Horstmann, Winfried; and Sochor, Josef, 4,276,559, Cl. 358-8.000.
Gast, Theodor; and Binder, Kurt, 4,275,586, Cl. 73-35.000.
Heitmann, Jurgen; Illetschko, Gerhard; and Maly, Hans-Peter, 4,276,563, Cl. 358-139.000.
Jundt, Werner; and Roozenbeek, Herman, 4,275,702, Cl. 123-610.000.
Topp, Bernhard; Friese, Karl-Hermann; and Haecker, Wolf-Dieter, 4,276,142, Cl. 204-195.00S.

Roberts, Colin A.; Nelson, John S.; Annan, David E.; and Robertson, Angus A. J. Carcass scalping. 4,275,481, Cl. 17-50.000.

Roberts, Leo L., to Centrilift-Hughes, Inc. Tandem thrust bearing. 4,275,938, Cl. 308-162.000.

Roberts, Wilbur N.: *See*—
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Robertson, Angus A. J.: *See*—
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Robinson, Joseph G.; and Brain, Sally A., to Coal Industry (Patents) Limited. Method of producing a resin for producing heat stable products, the resin and the products. 4,276,408, Cl. 528-247.000.

Robinson, Paul R.; and Bamberger, Carlos E., to United States of America, Energy. Thermochemical generation of hydrogen and oxygen from water. 4,276,279, Cl. 423-648.00R.

Robinson, Warn D.: *See*—
Mount, Ramon A.; and Robinson, Warn D., 4,276,222, Cl. 260-346.750.

Rockwell International Corporation: *See*—
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Kohlenberger, Charles W.; Kirkpatrick, Craig G.; Estrada, John A.; and Chang, George Q., 4,275,599, Cl. 73-774.000.

Rodenstock Instruments Corporation: *See*—
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Rodriguez, Rodolfo R.: *See*—
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Roe, Graham D.: *See*—
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Roeschlaub, John G.; and Hopkins, Ivan J., to Occidental Petroleum Corporation. Method for recycling the water used in a process for recovering glass from municipal waste. 4,276,155, Cl. 209-10.000.

Rogers, Charles J., to C. J. Rogers Enterprises Inc. Pressure actuated electrical system. 4,276,580, Cl. 362-22.000.

Rogers, Richard R. Method and apparatus for molding clay pigeons and the like. 4,276,015, Cl. 425-548.000.

Rogers, Robert C., to Koppers Company, Inc. Coke oven door spillage collection and disposal apparatus. 4,276,121, Cl. 202-227.000.

Rogerson Aircraft Controls: *See*—
Badger, Everett H.; and Rogerson, Michael J., 4,275,470, Cl. 4-316.000.

Rogerson, Michael J.: *See*—
Badger, Everett H.; and Rogerson, Michael J., 4,275,470, Cl. 4-316.000.

Rohm, Gunter H. Force-balanced lathe chuck with safety ring. 4,275,892, Cl. 279-1.00C.

Rohm and Haas Company: *See*—
Weir, W. David; and Kilbourn, Edward E., 4,276,290, Cl. 424-200.000.

Rolfs, John C.: *See*—
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Rolls-Royce Limited: *See*—
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Romand, Paul: *See*—
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Rommag P. Worwag & Co.: *See*—
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Roozenbeek, Herman: *See*—
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Roschlau, Peter: *See*—
Hundt, Dieter; Sedelmeyer, Marianne; Roschlau, Peter; Stahler, Fritz; and Gruber, Wolfgang, 4,276,376, Cl. 435-17.000.

Rose, Ira M.: *See*—
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Rose, Peter W. Process for preparing meat products having reduced shrinkage. 4,276,313, Cl. 426-247.000.

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Rosenberg, Larry. Portable laser device. 4,276,520, Cl. 331-94.50P.

Rosenhahn, Lothar: *See*—
Ohlschlager, Hans; Rosenhahn, Lothar; and Sauerteig, Wolfgang, 4,276,373, Cl. 430-507.000.

Rosinski, Edward J.: *See*—
Plank, Charles J.; Rosinski, Edward J.; and Givens, Edwin N., 4,276,151, Cl. 208-138.000.

Ross, Louis R., Jr.: *See*—
Kennedy, Joseph P.; Smith, Robert A.; and Ross, Louis R., Jr., 4,276,394, Cl. 525-245.000.

Ross, Warren K. Portable sawmill. 4,275,632, Cl. 83-794.000.

Rossing, Martin A.: *See*—
McDonald, Ray S.; and Rossing, Martin A., 4,275,738, Cl. 128-419.0PG.

Rostoker, William: *See*—
Tolley, William K.; Laughlin, William C.; and Rostoker, William, 4,276,083, Cl. 75-82.000.

Roth, Dieter: *See*—
Becker, Hans; Grimm, Peter; Ranke, Gerhard; and Roth, Dieter, 4,276,057, Cl. 55-40.000.

Rothwarf, Frederick: *See*—
Bergner, Robert L.; Rothwarf, Frederick; and Tauber, Arthur, 4,276,097, Cl. 148-101.000.

Rottinghaus, Robert B. Yieldable disc blade assembly. 4,275,791, Cl. 172-570.000.

Rowe, William D. Log-splitting apparatus. 4,275,779, Cl. 144-193.00A.

Rozenberg, Lev V.: *See*—
Zaslavsky, Dan; and Rozenberg, Lev V., 4,276,077, Cl. 71-64.0SC.

Rubin, Michael D.: *See*—
Ho, Pang T.; and Rubin, Michael D., 4,276,558, Cl. 357-74.000.

Rudbach, Jon A.: *See*—
Firca, Joseph R.; and Rudbach, Jon A., 4,276,050, Cl. 23-230.00B.

Ruff, Alonzo W., to Expertise Assistance Inc. Closure for service opening. 4,275,645, Cl. 98-36.000.

Ruggieri, Daniela: *See*—
Cassinelli, Giuseppe; Ruggieri, Daniela; Arcamone, Federico; and di Marco, Aurelio, 4,276,289, Cl. 424-180.000.

Rundell, Herbert A., to Texaco Inc. Heavy duty dynamic high-torque-measurement coupling unit. 4,275,588, Cl. 73-862.320.

Ruschepaul, Klaus-Jorg, to Hoechst Aktiengesellschaft. Device for separating sheets. 4,275,878, Cl. 271-170.000.

Russ, Raymond. Alarm system for dwellings. 4,276,542, Cl. 340-326.000.

Russell, David B., to Dennison Manufacturing Company. Method for the stretching of fasteners. 4,276,255, Cl. 264-288.800.

Rutner, Herman: *See*—
Akerkar, Anandrao S.; and Rutner, Herman, 4,276,280, Cl. 424-1.000.

Ryan, Edward C.; and Parker, Jimmy J., to Deere & Company. Load responsive drive mechanism. 4,276,037, Cl. 474-70.000.

Ryan, James W.; and Chung, Alfred. High sensitivity assays for angiotensin converting enzyme. 4,276,378, Cl. 435-23.000.

Rydval, Peter, to Siemens Aktiengesellschaft. Monolithic digital semiconductor circuit comprising a plurality of bipolar transistors. 4,276,485, Cl. 307-463.000.

Rylands, Harry D.: *See*—
Bolton, Colin B.; Rylands, Harry D.; Turner, Clara; and Turner, Henry W., 4,275,858, Cl. 244-121.000.

S & S Industries, Inc.: *See*—
Weston, Jerome L., 4,275,740, Cl. 128-469.000.

Sabee Products, Inc.: *See*—
Sabee, Reinhardt N., 4,276,336, Cl. 428-132.000.

Sabee, Reinhardt N., to Sabee Products, Inc. Multi-apertured web with incremental orientation in one or more directions. 4,276,336, Cl. 428-132.000.

Saeman, Walter C., to Olin Corporation. Round multi-layered calcium hypochlorite granules. 4,276,349, Cl. 428-403.000.

Saffer, Bernard A., to National Distillers and Chemical Corporation. Separation of ethylene glycol from N-methylpyrrolidone. 4,276,126, Cl. 203-69.000.

Saint-Dizier, Gilbert: *See*—
Cordier, Michel; Labaquere, Herve; and Saint-Dizier, Gilbert, 4,276,181, Cl. 210-741.000.

St. Georgiev, Vasil; Loev, Bernard; Mack, Robert; and Musser, John, to USV Pharmaceutical Corporation. Triazolobenzoxazin-4-ones. 4,276,292, Cl. 424-248.400.

St. John, Charles F.; and Mercier, Gil A., to Lafarge Consultants Ltd. Manufacture of cement. 4,276,092, Cl. 106-100.000.

Saito, Masaki: *See*—
Yoshikawa, Katsushi; Saito, Masaki; Ota, Tadaki; and Inoue, Mitsumasa, 4,276,238, Cl. 261-39.00D.
Yoshikawa, Katsushi; Saito, Masaki; Ota, Tadaki; and Inoue, Mitsumasa, 4,276,239, Cl. 261-44.00E.

Saito, Takayuki: *See*—
Iwami, Etsuji; and Saito, Takayuki, 4,276,388, Cl. 525-48.000.

Saito, Tsuyoshi: *See*—
Kageyama, Hiroshi; and Saito, Tsuyoshi, 4,275,814, Cl. 206-455.000.

Saitou, Tadashi: *See*—
Sakamaki, Hiroshi; Maeda, Toshiyuki; Ushijima, Fumihiro; and Saitou, Tadashi, 4,276,007, Cl. 418-152.000.

Sakaguchi, Masayuki: *See*—
Yoshizawa, Tadao; and Sakaguchi, Masayuki, 4,275,909, Cl. 285-110.000.

Sakaguchi, Seiichiro: *See*—
Kuroda, Michio; Nakamura, Shozo; Tsukahara, Satoshi; Akatu, Yasuaki; Sugita, Shigehisa; Kaneko, Kojiro; Sakaguchi, Seiichiro; and Oshima, Ryoichiro, 4,275,563, Cl. 60-673.000.

Sakai, Katsuya; Mita, Ryuichi; Kato, Toshio; Higuchi, Chojiro; and Murakami, Hisamichi, to Mitsui Toatsu Chemicals Incorporated.

Oxidation-reduction reagents for a wet desulfurization process and a process for preparing same. 4,276,187, Cl. 252-186.000.

Sakai, Kohichi: *See—*
Ogawa, Yoshinari; Fukumoto, Teruhisa; and Sakai, Kohichi, 4,276,208, Cl. 260-28.00R.

Sakamaki, Hiroshi; Maeda, Toshiyuki; Ushijima, Fumihiro; and Saitou, Tadashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Rotary pump with carbon vanes and an aluminum cylindrical sleeve in the housing. 4,276,007, Cl. 418-152.000.

Sakamaki, Hisashi: *See—*
Tachika, Tetsuji; Sakamaki, Hisashi; and Hattori, Hiroyuki, 4,275,958, Cl. 355-14.00R.

Sakamoto, Hitoshi, to Sony Corporation. Slow or still mode video signal reproducing apparatus with incremented tape movement. 4,276,571, Cl. 360-10.000.

Sakamoto, Kazuho: *See—*
Nagamoto, Shun'ichi; and Sakamoto, Kazuho, 4,276,468, Cl. 235-92.0CT.

Sakimae, Akihiro; and Onishi, Hisao, to Mitsubishi Rayon Company, Ltd. Preparation of immobilized enzymes of microorganisms. 4,276,381, Cl. 435-179.000.

Sakito, Yoji: *See—*
Mukaiyama, Teruaki; and Sakito, Yoji, 4,276,217, Cl. 260-340.90R.

Saldinger, Neil N., to Vernitron Corporation. Brushless DC motor with rare-earth magnet rotor and segmented stator. 4,276,490, Cl. 310-184.000.

Sale, Bernard: *See—*
Brun, Didier; Chrysostome, Gerard; Feugier, Alain; and Sale, Bernard, 4,276,266, Cl. 423-1.000.

Saltz, Ivan K.: *See—*
Drbal, Vladimir J.; Ginsberg, Guenter; Hodgins, Bruce J.; Richardson, John A.; Britton, Ted W.; Grimm, Richard M.; Bello, Ernesto; Rodriguez, Rodolfo R.; and Saltz, Ivan K., 4,276,260, Cl. 422-100.000.

Sam, Ahmad: *See—*
Epner, Randolph L.; and Sam, Ahmad, 4,276,147, Cl. 204-272.000.

Sander, Ulrich: *See—*
Blumrich, Walter; Dorr, Karl H.; Konig, Hans J.; and Sander, Ulrich, 4,276,116, Cl. 159-47.00R.

Sandlas, Richard D.: *See—*
Orlowski, Gerald J.; Wicklund, Rodney D.; Sandlas, Richard D.; and Weibler, Walter W., 4,276,318, Cl. 426-513.000.

Sandler, Stanley R.: *See—*
Miano, Jeffrey D.; and Sandler, Stanley R., 4,276,387, Cl. 521-167.000.

Sangamo Weston, Inc.: *See—*
Boreas, Willem J. L., 4,276,511, Cl. 324-150.000.

Sanyo Silicon Electronics Co., Ltd.: *See—*
Shimizu, Hiroshi, 4,276,537, Cl. 338-35.000.

Sarcander, Hans: *See—*
Blohm, Reinhard; Karl, Rupert; and Sarcander, Hans, 4,275,553, Cl. 57-263.000.

Sargent & Greenleaf, Inc.: *See—*
Miller, Harry C., 4,275,576, Cl. 70-303.00A.

Sasaki, Jack S. Preheating unit for domestic hot water supply. 4,275,687, Cl. 122-20.00B.

Satchell, Fred E.; and Joslin, Joel A., to Sherwood Medical Industries, Inc. Apparatus and method for producing tubular extrusions having axial sections of materials having different characteristics. 4,276,250, Cl. 264-167.000.

Sato, Mitsuya: *See—*
Watanabe, Yasuaki; Okabe, Yukio; Kojima, Shinichi; and Sato, Mitsuya, 4,276,560, Cl. 358-28.000.

Sato, Yasuhiko; Koizumi, Jun; and Tokushige, Yuji, to Shin-Etsu Chemical Co. Ltd. Photocurable organopolysiloxane compositions. 4,276,135, Cl. 204-159.130.

Sato, Yoichi: *See—*
Nishikawa, Masao; Aoyama, Toshihiko; and Sato, Yoichi, 4,275,798, Cl. 180-143.000.

Satoh, Katsuhiko; Asano, Kazuhiro; Mandai, Masaaki; Ueda, Makoto; Torisawa, Akira; and Shida, Masaharu, to Kabushiki Kaisha Daini Seikosha. Electronic watch. 4,276,626, Cl. 368-80.000.

Sauerteig, Wolfgang: *See—*
Ohlschlager, Hans; Rosenhahn, Lothar; and Sauerteig, Wolfgang, 4,276,373, Cl. 430-507.000.

Savage, Basil W., Sr., to Savage Equipment, Inc. Tree shaker. 4,275,548, Cl. 56-328.0TS.

Savage Equipment, Inc.: *See—*
Savage, Basil W., Sr., 4,275,548, Cl. 56-328.0TS.

Sawada, Daisaku: *See—*
Takeda, Yuji; Shigematsu, Takashi; and Sawada, Daisaku, 4,275,692, Cl. 123-419.000.

Sawafuji, Tadashi. Speaker or microphone having corrugated diaphragm with conductors thereon. 4,276,449, Cl. 179-115.5PV.

Sawyer, Willard H., to Exxon Research & Engineering Co. Catalyst and hydroconversion process utilizing the same. 4,276,201, Cl. 252-455.00R.

SBS Corporation: *See—*
Smith, Jeffrey O., 4,275,831, Cl. 237-2.00R.

Schaaf, Norbert: *See—*
Meyer, Juergen; Schaaf, Norbert; and Kunze, Claus, 4,276,534, Cl. 338-15.000.

Schaefer, Gustave J., to United States of America, National Aeronautics and Space Administration. Apparatus and method for determining the position of a radiant energy source. 4,276,553, Cl. 343-112.00R.

Schaeffer, Friedrich K.; and Brennan, Thomas F., to General Electric Company. Method for compacting transposed cable strands. 4,276,102, Cl. 156-85.000.

Schael, Wilfried, to Dr. Eduard Fresenius, Chemisch-pharmazeutische Industrie KG Apparatebau KG. Apparatus for fluid balancing under , sterile conditions. 4,275,726, Cl. 128-213.00A.

Schaus, Orland O.; and Overall, John C. K., to Canadian Gas Research Institute. Two-stage heat exchanger. 4,275,705, Cl. 126-110.00R.

Schenk, Erwin: *See—*
Siglow, Joachim; Grutzmann, Sigmar; and Schenk, Erwin, 4,276,642, Cl. 370-100.000.

Schering AG: *See—*
Franke, Heinrich; and Joppien, Hartmut, 4,276,309, Cl. 424-322.000.

Schiffer, Gunter, to Kleinewefers GmbH. Device for wet pre-treatment of web-shaped textile material in a damper. 4,275,575, Cl. 68-5.00E.

Schils, Petrus J. R., to Keystone International, Inc. Valve assembly and method. 4,275,867, Cl. 251-297.000.

Schivley, George P., Jr.; and Madonna, Peter L., to Ingersoll-Rand Company. Automatic control system for rock drills. 4,275,793, Cl. 173-9.000.

Schlager, Richard J.; and Murphy, James F., to Kaiser Aluminum & Chemical Corporation. Cement waste product as scrubbing medium for sulfur oxides. 4,276,272, Cl. 423-244.000.

Schlumberger Technology Corporation: *See—*
Lee, Arley G., 4,275,786, Cl. 166-65.00R.
Maricelli, James J., 4,276,599, Cl. 364-422.000.

Schmidberger, Rainer; and Donitz, Wolfgang, to Dornier System GmbH. Process for the manufacture of electrodes having perovskite structure for electrochemical high temperature cells. 4,276,202, Cl. 252-462.000.

Schmidt, Peter: *See—*
Bauer, Hartmut; Schmidt, Peter; Stocker, Herbert; and Przybyla, Bernd, 4,275,695, Cl. 123-486.000.

Schmolka, Irving R.; and Niu, Joseph H. Y., to BASF Wyandotte Corporation. Coal-oil slurries containing a surfactant. 4,276,054, Cl. 44-51.000.

Schmuhl, Jeffrey L.: *See—*
Manning, William P.; Rehm, Stephen J.; and Schmuhl, Jeffrey L., 4,276,271, Cl. 423-226.000.

Schnegg, Peter; Rapp, Walter; and Vosteen, Bernhard, to Bayer Aktiengesellschaft. Process for the preparation of alkali metal salts of hydroxybenzoates, which are substantially anhydrous and free from hydroxybenzoic acid. 4,276,431, Cl. 560-67.000.

Schneider, Thomas D.: *See—*
Burson, Nancy; and Schneider, Thomas D., 4,276,570, Cl. 358-903.000.

Schoennagel, Hans-Juergen: *See—*
McHale, William D.; and Schoennagel, Hans-Juergen, 4,276,152, Cl. 208-139.000.

Schoeps, Jochen: *See—*
Hohlein, Peter; and Schoeps, Jochen, 4,276,210, Cl. 260-29.4UA.

Schoettle, Klaus; Hoffmann, Werner; Kaemmer, Eduard; Boehlke, Klaus; and Lewin, Helmut, to BASF Aktiengesellschaft. Tape guide for high-speed tape transport apparatus. 4,276,575, Cl. 360-130.210.

Scholl, Hans-Joachim; Dieterich, Dieter; and Markusch, Peter, to Bayer Aktiengesellschaft. Process for the production of inorganic-organic synthetic materials. 4,276,404, Cl. 528-57.000.

Schrader, Clarence O.: *See—*
Artaud, Gerard P.; Schrader, Clarence O.; and Reinke, George W., 4,275,655, Cl. 101-123.000.

Schrape, Peter: *See—*
Worner, Gunter; and Schrape, Peter, 4,275,613, Cl. 74-475.000.

Schreier, Hermann: *See—*
Bullivant, Kenneth W.; and Schreier, Hermann, 4,275,808, Cl. 198-533.000.

Schremmer, Stanley M. Hay bale handling device. 4,275,985, Cl. 414-722.000.

Schreyer, Kenneth D.: *See—*
Stone, Franz T.; and Schreyer, Kenneth D., 4,275,556, Cl. 59-93.000.

Schriever, Theodore W., to Dart Industries Inc. Modular taboret kit. 4,275,666, Cl. 108-101.000.

Schroeder, Norman C.: *See—*
McIsaac, Lyle D.; Krupa, Joseph F.; and Schroeder, Norman C., 4,276,235, Cl. 260-990.000.

Schubert & Salzer: *See—*
Blohm, Reinhard; Karl, Rupert; and Sarcander, Hans, 4,275,553, Cl. 57-263.000.

Schwartz, Robert E.; Neff, Laurence M.; and Utter, Gary N. Pipeline pig. 4,275,475, Cl. 15-104.06R.

Schwarz, Otto: *See—*
Eibl, Martha; Schwarz, Otto; and Linnau, Yendra, 4,276,283, Cl. 424-85.000.

Schwindt, Jurgen; and Grogler, Gerhard, to Bayer Aktiengesellschaft. Diisocyanates having urea groups, a process for their preparation and their use in the production of polyurethanes. 4,276,386, Cl. 521-160.000.

Schwitters, Stephen W., to Beatrice Foods Co. Method and apparatus for controlling operation of a soft-serve machine. 4,275,567, Cl. 62-63.000.

Scopelianos, Angelo G.: *See—*
United States of America, National Aeronautics and Space Administration; Allcock, Harry R.; O'Brien, John P.; Scopelianos, Angelo G.; and Fewell, Larry L., 4,276,403, Cl. 528-4.000.

Scott, Linzy, Jr. Knee brace. 4,275,716, Cl. 128-80.00C.

Scott, Peter R. Roll fastener for photographic film. 4,276,371, Cl. 430-501.000.
Scripps Clinic & Research Foundation: *See—*
Katz, David H., 4,276,206, Cl. 260-6.000.
Scully Electronic Systems, Inc.: *See—*
Wisnia, Jeffry A., 4,276,536, Cl. 338-23.000.
Sease, John D.: *See—*
Lackey, Walter J.; Lowrie, Robert S.; and Sease, John D., 4,276,063, Cl. 55-84.000.
Secora, James C.: *See—*
Bench, Stephen M.; Dirkes, William R.; Juglekar, Manohar A.; Secora, James C.; and Stephen, Michael A., 4,276,651, Cl. 375-120.000.
Sedelmeyer, Marianne: *See—*
Hundt, Dieter; Sedelmeyer, Marianne; Roschlau, Peter; Stahler, Fritz; and Gruber, Wolfgang, 4,276,376, Cl. 435-17.000.
Segnitz, Adolph: *See—*
Petersen, Harro; Krause, Hans-Joachim; Fischer, Kurt; Segnitz, Adolph; and Zaunbrecher, Horst, 4,276,209, Cl. 260-28.00P.
Seiko Koki Kabushiki Kaisha: *See—*
Kitai, Kiyoshi; Takazawa, Yuzuru; and Nagaoka, Shinji, 4,275,955, Cl. 354-268.000.
Seipos, Andrew G.: *See—*
Jureit, J. Calvin; Seipos, Andrew G.; and Langevin, William J., 4,275,854, Cl. 242-55.000.
Seitchik, Jerold A.: *See—*
Haggard, Roger L.; Seitchik, Jerold A.; and Rao, T. R. N., 4,276,646, Cl. 371-37.000.
Sekiguchi, Tsunetoshi: *See—*
Matsumura, Osamu; Kato, Yutaka; Sekiguchi, Tsunetoshi; and Namiki, Ryo, 4,276,629, Cl. 368-86.000.
Seko, Maomi; Ogawa, Shinsaku; and Takemura, Reiji, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the production of high purity aqueous alkali hydroxide solution. 4,276,130, Cl. 204-98.000.
Self, James: *See—*
Gragg, F. Michael; and Self, James, 4,276,270, Cl. 423-167.000.
Selman, Charles M.; and Fodor, Lawrence M., to Phillips Petroleum Company. Polymerization catalysts. 4,276,192, Cl. 252-429.00B.
Semenov, Valentin P.: *See—*
Anoshko, Vladimir A.; Godin, Eduard M.; Gavrilov, Anatoly N.; Zverkov, Garik E.; Matskevich, Vladimir I.; Chepurin, Valentin M.; Semenov, Valentin P.; Grachev, Vladimir V.; and Butylin, Mikhail Y., 4,275,579, Cl. 72-59.000.
Senba, Shunsuke: *See—*
Hayashi, Yoshiro; Sugihara, Akira; Shimura, Takaki; Ishikawa, Kozo; Wada, Kiyoshi; Yamanaka, Eiji; and Senba, Shunsuke, 4,276,572, Cl. 360-12.000.
Sesamat Anstalt: *See—*
Riedel, Tilo, 4,275,781, Cl. 152-224.000.
Shallhorn, Paul M.: *See—*
Karnis, Alkibiadis; and Shallhorn, Paul M., 4,276,119, Cl. 162-49.000.
Shambaugh, John S.: *See—*
Boudrot, Robert J.; Shambaugh, John S.; and Zeltzer, Hyman, 4,276,361, Cl. 429-186.000.
Shaner, Ronald E.: *See—*
Groth, Hugh F.; Hunt, Guilbert M.; and Shaner, Ronald E., 4,275,651, Cl. 100-229.00A.
Shape Inc.: *See—*
Gelardi, Anthony; Gelardi, Paul; Swinburne, Stephen; Janiszewski, Michael; MacLeod, Robert, Jr.; Philippe, James; and Philippe, David, 4,275,943, Cl. 312-319.000.
Shapiro, Anatoly S.: *See—*
Kalashnikov, Leonid F.; Kudiarov, Vladimir N.; Kushnir, Georgy M.; Shapiro, Anatoly S.; Konstantinov, Rjury I.; Nikolaev, Vadim V.; and Kunets, Vladimir K., 4,275,988, Cl. 415-74.000.
Shapiro, Daniel H.: *See—*
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Sharma, Ashok K.: *See—*
Hahn, Allen W.; Nichols, Michael F.; Sharma, Ashok K.; and Hellmuth, Eckhard W., 4,276,144, Cl. 204-195.00P.
Sharma, Shri C., to CPC International Inc. Process for treating nuts. 4,276,316, Cl. 426-466.000.
Sharp Kabushiki Kaisha: *See—*
Inoue, Tomohiro; Tanimoto, Akira; and Washizuka, Isamu, 4,276,541, Cl. 340-146.3SY.
Tanimoto, Akira; Masuzawa, Sigeaki; Shibata, Shinya; and Nishizaki, Shinzo, 4,276,444, Cl. 179-1.0SM.
Shartzer, Kenneth B., to Plastic Machinery Corporation. Pipe beller with force determined temperature. 4,276,010, Cl. 425-143.000.
Shatto, Walter C., Jr.: *See—*
Boutcher, Andrew G., Jr.; and Shatto, Walter C., Jr., 4,275,495, Cl. 29-749.000.
Shavel, John, Jr.: *See—*
Brown, Richard E.; Puchalski, Chester; and Shavel, John, Jr., 4,276,296, Cl. 424-256.000.
Shea, Henry J.: *See—*
Sumka, Elmer H.; and Shea, Henry J., 4,276,500, Cl. 318-369.000.
Sheffield, David J.; and Fulton, Martyn R. Breakstem riveting tool with stem disposal device. 4,275,582, Cl. 72-391.000.
Sheffield, David J.: *See—*
Gilbert, Terence; and Sheffield, David J., 4,275,583, Cl. 72-391.000.
Shelhigh Inc.: *See—*
Gabbay, Shlomo, 4,275,469, Cl. 3-1.500.
Shell Oil Company: *See—*
Haynes, George R., 4,276,307, Cl. 424-304.000.
Hoxmeier, Ronald J., 4,276,199, Cl. 252-438.000.
Shelley, Peter S.: *See—*
Srinivasa, Saroja R.; Shelley, Peter S.; and Hueschen, Robert E., 4,276,493, Cl. 313-330.000.
Sherwood Medical Industries, Inc.: *See—*
Satchell, Fred E.; and Joslin, Joel A., 4,276,250, Cl. 264-167.000.
Shibata, Kazuo, to Nissan Motor Company, Limited. Weft cutting device in shuttleless loom. 4,275,773, Cl. 139-429.000.
Shibata, Shinya: *See—*
Tanimoto, Akira; Masuzawa, Sigeaki; Shibata, Shinya; and Nishizaki, Shinzo, 4,276,444, Cl. 179-1.0SM.
Shibata, Takanori: *See—*
Okawa, Tadashi; Honbu, Mitsuyuki; Matsuda, Yasuo; Shibata, Takanori; and Kawaguchi, Toshio, 4,276,589, Cl. 363-71.000.
Shibuya, Kyoichi; and Ihara, Tomomi, to Sumitomo Cement Co., Ltd. Method for heating powder material and apparatus for carrying out said method. 4,276,020, Cl. 432-14.000.
Shida, Masaharu: *See—*
Satoh, Katsuhiko; Asano, Kazuhiro; Mandai, Masaaki; Ueda, Makoto; Torisawa, Akira; and Shida, Masaharu, 4,276,626, Cl. 368-80.000.
Shigematsu, Takashi: *See—*
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Shiley Incorporated: *See—*
Fettel, Bruce E.; Morris, Paul E.; and Lichte, Leo J., 4,276,132, Cl. 204-129.100.
Shimada, Koji; and Koike, Seiji, to Mitsui Petrochemical Industries, Ltd.; and Kabushiki Kaisha Takeda Sangyo. Reinforced resinous laminate. 4,276,347, Cl. 428-332.000.
Shimatani, Ryoichi: *See—*
Kanzaki, Nobuyoshi; Toyama, Kenji; Nakano, Katsutoshi; Shimatani, Ryoichi; and Kudo, Fumio, 4,276,129, Cl. 204-58.000.
Shimizu, Akira, to Shin Meiwa Industry Co., Ltd. Roller feed type insulated wire cutting and insulation stripping machine. 4,275,619, Cl. 81-9.510.
Shimizu, Hiroshi, to Sanyo Silicon Electronics Co., Ltd. Moisture-responsive resistor element. 4,276,537, Cl. 338-35.000.
Shimizu, Yoichi, to Kabushiki Kaisha Maruyama Seisakusho. Heddle frame. 4,275,772, Cl. 139-91.000.
Shimura, Takaki: *See—*
Hayashi, Yoshiro; Sugihara, Akira; Shimura, Takaki; Ishikawa, Kozo; Wada, Kiyoshi; Yamanaka, Eiji; and Senba, Shunsuke, 4,276,572, Cl. 360-12.000.
Shin-Etsu Chemical Co., Ltd.: *See—*
Asai, Michihiko; Suda, Yoshio; Imada, Kiyoshi; Ueno, Susumu; and Nomura, Hirokazu, 4,276,138, Cl. 204-165.000.
Sato, Yasuhiko; Koizumi, Jun; and Tokushige, Yuji, 4,276,135, Cl. 204-159.130.
Shin Meiwa Industry Co., Ltd.: *See—*
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Shirasu, Hirotoshi, to Hitachi, Ltd. Signal processing apparatus for subscriber circuits. 4,276,447, Cl. 179-18.0FG.
Shkidchenko, Alexandr N.: *See—*
Redikultsev, Jury V.; Shkidchenko, Alexandr N.; Gorbunov, Oleg P.; and Litvinenko, Leonid A., 4,276,264, Cl. 422-307.000.
Shorr, Jacob, to Systems Engineering & Manufacturing Corp. Water purification system. 4,276,176, Cl. 210-637.000.
Short, James E., Jr.: *See—*
Colvin, Robert E.; Douda, Bernard E.; Montgomery, Francis E.; and Short, James E., Jr., 4,276,100, Cl. 149-109.600.
Shure Brothers, Inc.: *See—*
Anderson, Carl R.; Wellwood, James J.; and Happ, Lawrence R., 4,275,888, Cl. 369-74.000.
Shuster, James S., to PPG Industries, Inc. Fluid replacement system for hydraulic actuators for glass sheet shaping molds and method of press bending glass sheets. 4,276,074, Cl. 65-106.000.
Siegel, Dorothy, executrix: *See—*
Boser, Ronald J.; Watts, Henry J.; and Siegel, Walter P., deceased, 4,275,673, Cl. 112-105.000.
Siegel, Walter P., deceased: *See—*
Boser, Ronald J.; Watts, Henry J.; and Siegel, Walter P., deceased, 4,275,673, Cl. 112-105.000.
Siegman, Edwin J.; and Yelverton, Roy L., to American Cyanamid Company. Spinnerette assembly. 4,276,011, Cl. 425-198.000.
Siemens Aktiengesellschaft: *See—*
Beck, Rudolf K., deceased, 4,275,565, Cl. 62-55.000.
Hassler, Dieter, 4,275,595, Cl. 73-606.000.
Hjort, Bo, 4,275,743, Cl. 128-731.000.
Rydval, Peter, 4,276,485, Cl. 307-463.000.
Siglow, Joachim; Grutzmann, Sigmar; and Schenk, Erwin, 4,276,642, Cl. 370-100.000.
Straihammer, Reinhard, 4,276,025, Cl. 433-105.000.
Siewert, Ingo; Klaue, Manfred; and Thietz, Peter. Process for high frequency heat sealing of textile sheet members. 4,276,109, Cl. 156-273.000.
SIG Schweizerische Industrie-Gesellschaft: *See—*
Egli, Alwin, 4,275,775, Cl. 141-83.000.
Siglow, Joachim; Grutzmann, Sigmar; and Schenk, Erwin, to Siemens Aktiengesellschaft. Process for the frame synchronization of a time division multiplex system. 4,276,642, Cl. 370-100.000.
Sih, John C., to Upjohn Company, The. 19,20-Didehydro-PG_1 compounds. 4,276,427, Cl. 560-53.000.
Sih, John C., to Upjohn Company, The. 19,20-Didehydro-13,14-dihydro-PG_1 compounds. 4,276,428, Cl. 560-53.000.

Sih, John C., to Upjohn Company, The. 19,20-Didehydro-13,14-dihydro-PG$_1$, sulfonyl amides. 4,276,434, Cl. 564-98.000.

Sih, John C., to Upjohn Company, The. 19,20-Didehydro-PG$_1$, sulfonyl amides. 4,276,435, Cl. 564-98.000.

Sih, John C., to Upjohn Company, The. 19-Keto-PG sulfonylamides. 4,276,436, Cl. 564-98.000.

Silver, Jules; and Ennis, James F., to Silver, Jules. Adjustable dosage syringe. 4,275,729, Cl. 128-218.00C.

Silverberg, Morton, to Xerox Corporation. Interrupted jet air knife for sheet separator. 4,275,877, Cl. 271-166.000.

Silverman, Richard V., to Bonus-Bilt, Inc. Variable configuration container with modular, easily removable wall or shelf structure. 4,275,665, Cl. 108-14.000.

Silvester, Robert C., to Eaton Corporation. Shift control for change speed gear transmission for vehicle. 4,275,612, Cl. 74-473.00R.

Simmonds, Joseph K.: *See*—
Riggs, E. Gray; Simmonds, Joseph K.; and Browning, Vernon D., 4,275,768, Cl. 138-104.000.

Simonsson, Leif R.: *See*—
Claeson, Karl G.; Aurell, Leif E.; and Simonsson, Leif R., 4,276,375, Cl. 435-13.000.

Sing, Gerhard: *See*—
Wellendorf, Klaus; and Sing, Gerhard, 4,276,567, Cl. 358-280.000.

Singer Company, The: *See*—
Gwynn, Eric C., 4,276,028, Cl. 434-20.000.
Killinger, Karl H., 4,275,675, Cl. 112-229.000.
Odermann, Charles R., 4,275,939, Cl. 312-208.000.
Wittke, Ernest C., 4,276,512, Cl. 328-133.000.

Singer, Frederic J. Manhole structure and method of making same. 4,275,757, Cl. 137-363.000.

Singer, William; Nowak, Milton; and Ingles, Norma, to Troy Chemical Corporation. Stabilization composition for coating composition. 4,276,211, Cl. 260-29.6MN.

Singewald, Arno; Fricke, Gunter; Neitzel, Ulrich; and Geisler, Iring, to Kali and Salz Aktiengesellschaft. Process for the electrostatic separation of crude potash salts. 4,276,154, Cl. 209-3.000.

Sinha, Ashok K.: *See*—
Levinstein, Hyman J.; Murarka, Shyam P.; and Sinha, Ashok K., 4,276,557, Cl. 357-67.000.

Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; Krehan, Ingomar; Kraus, Peter; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating pests with N-(4-substituted-phenyl)-N'-(2-substituted-benzoyl)-thioureas. 4,276,310, Cl. 424-322.000.

Sivachenko, E. W.: *See*—
Sivachenko, Eugene W.; and Broacha, Firoze H., 4,275,663, Cl. 105-413.000.

Sivachenko, Eugene W.; and Broacha, Firoze H., to Sivachenko, E. W. Corrugated vehicle underframe. 4,275,663, Cl. 105-413.000.

Sizukuisi, Touru: *See*—
Mouri, Takenori; Morimoto, Kengi; Yoshimoto, Itaru; Kayama, Hiroyki; Okazawa, Yukio; and Sizukuisi, Touru, 4,275,648, Cl. 99-483.000.

Skala, Stephen F. Electrolytic anolyte dehydration of castner cells. 4,276,145, Cl. 204-247.000.

Skogler, Brian I., to Prince Corporation. Visor with storage compartment. 4,275,916, Cl. 296-97.00H.

Skryantz, John S.: *See*—
Karayannis, Nicholas M.; Grams, Harold; and Skryantz, John S., 4,276,191, Cl. 252-429.00C.

Slade, Paul G.: *See*—
Kimblin, Clive W.; and Slade, Paul G., 4,276,455, Cl. 200-144.00B.

Slate, Matthew W.: *See*—
McCalmont, Arnold M.; and Slate, Matthew W., 4,276,652, Cl. 455-29.000.

Slinkard, William E.: *See*—
Dalton, Charles A.; and Slinkard, William E., 4,276,196, Cl. 252-435.000.

Small, J. W.: *See*—
LeBlond, J. Paul, 4,275,820, Cl. 222-3.000.

Smith, David W.: *See*—
Elkins, Christopher W.; and Smith, David W., 4,275,908, Cl. 285-55.000.

Smith, Herman W., to Upjohn Company, The. ω-Aryl-13,14-didehydro-PGF compounds. 4,276,429, Cl. 560-55.000.

Smith, Jeffrey O., to SBS Corporation. Make up air system. 4,275,831, Cl. 237-2.00R.

Smith Kline & French Laboratories Limited: *See*—
Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., 4,276,301, Cl. 424-273.00R.

Smith, Oliver W.: *See*—
Koleske, Joseph V.; Smith, Oliver W.; France, Haywood G.; and Taller, Robert A., 4,276,405, Cl. 528-58.000.

Smith, Richard: *See*—
Turner, Donald M.; and Smith, Richard, 4,275,600, Cl. 73-843.000.

Smith, Robert A.: *See*—
Kennedy, Joseph P.; Smith, Robert A.; and Ross, Louis R., Jr., 4,276,394, Cl. 525-245.000.

Smith, Ronald L., to Century International Corp. Method and apparatus for periodic partial deactivation of an automatic pinsetter. 4,275,884, Cl. 273-43.00A.

Smith, Russell G., to Xomox Corporation. Air actuated fail-safe actuator encapsulated within accumulator tank. 4,275,642, Cl. 91-415.000.

Smith, Stuart B.: *See*—
Montgomery, Robert L.; and Smith, Stuart B., 4,276,008, Cl. 425-4.00R.

Smith, Verity C., to Vaponics Inc. High efficiency filtration with impurity concentration and ultrafiltration rejection flow recirculation. 4,276,177, Cl. 210-638.000.

SmithKline Instruments, Inc.: *See*—
Quedens, Phillipp J.; Haverl, Ronald A.; and Stoller, Milton, 4,275,597, Cl. 73-618.000.

Snitzer, Elias; Anschutz, Donald E.; and Fox, Edward V., Jr, to United Technologies Corporation. Long stroke, high resolution optical position sensor. 4,275,965, Cl. 356-375.000.

Snow, Barton H.: *See*—
Wright, Jack D.; and Snow, Barton H., 4,275,560, Cl. 60-226.00B.

Snoy, Joseph B., to Twin Disc, Incorporated. Power transmission having power take-off shaft and fluid control means therefor. 4,275,607, Cl. 74-15.630.

Snyder, Wesley L. Solar distillation apparatus. 4,276,122, Cl. 202-234.000.

Sochor, Jerzy R. Miniature connector receptacles employing contacts with bowed tines and parallel mounting arms. 4,275,944, Cl. 339-74.00R.

Sochor, Josef: *See*—
Foerster, Hubert; Horstmann, Winfried; and Sochor, Josef, 4,276,559, Cl. 358-8.000.

Societe Anonyme Automobiles Citroen: *See*—
Largeteau, Pierre A., 4,275,530, Cl. 51-355.000.

Societe Anonyme Dite BBM: *See*—
Bo, Ermanno, 4,275,652, Cl. 101-4.000.

Societe Crouzet: *See*—
Laprie, Jean-Claude; Powell, David R.; Alcouffe, Gerard; and Romand, Paul, 4,276,643, Cl. 371-8.000.

Societe de Recherches et de Syntheses Organiques S.A.: *See*—
Baudet, Pierre, 4,276,421, Cl. 548-342.000.

Societe Heurtey Effluthern: *See*—
Brun, Didier; Chrysostome, Gerard; Feugier, Alain; and Sale, Bernard, 4,276,266, Cl. 423-1.000.

Societe Nationale des Poudres et Explosifs: *See*—
Dallet, Francis A., 4,275,657, Cl. 102-531.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See*—
Dron, Sylvain M.; and Evrard, Gerard M. G., 4,276,489, Cl. 310-155.000.

Soderbaum, Carl U., to AB Volvo Penta. Boat propeller. 4,275,991, Cl. 416-142.000.

Soehngen, John W., to Celanese Corporation. Removing halogenated hydrocarbons from aqueous media by utilizing a polyolefinic microporous adsorbent. 4,276,179, Cl. 210-679.000.

Soeters, Cornelis: *See*—
Padley, Frederick B.; Paulussen, Cornelis N.; Soeters, Cornelis; and Tresser, David, 4,276,322, Cl. 426-660.000.

Solfan Systems, Inc.: *See*—
Lutz, Erno B., 4,276,548, Cl. 343-7.0PL.

Solyanichenko, Nikolai A.: *See*—
Stakhov, Alexei P.; Solyanichenko, Nikolai A.; Luzheisky, Vladimir A.; Ovodenko, Alexandr V.; and Kozak, Andrei A., 4,276,608, Cl. 364-768.000.

Sone, Masazumi: *See*—
Fukumori, Yukitsugu; and Sone, Masazumi, 4,275,690, Cl. 123-146.50A.

Sony Corporation: *See*—
Koizumi, Akio, 4,276,587, Cl. 363-26.000.
Sakamoto, Hitoshi, 4,276,571, Cl. 360-10.000.
Suyama, Hideo; and Ugaji, Masana, 4,276,452, Cl. 179-180.000.

Sorensen, Harry D. Respiratory exerciser and rebreathing device. 4,275,722, Cl. 128-200.240.

Southeastern Foam Products, Inc.: *See*—
Montgomery, Robert L.; and Smith, Stuart B., 4,276,008, Cl. 425-4.00R.

Spanjersberg, Albertus C.; Mink, Hans G.; and Barwegen, Johannes H. M., to Akzo N.V. Process and apparatus for the electrostatic spraying of electrically conductive paint. 4,275,834, Cl. 239-3.000.

Speca, Anthony N.: *See*—
Rekers, Louis J.; and Speca, Anthony N., 4,276,399, Cl. 526-106.000.

Spector, George: *See*—
Ragavan, Soman; and Spector, George, 4,275,681, Cl. 116-70.000.

Speer, Howard D., Jr.; and Proett, Mark A., to Black & Decker Manufacturing Company, The. Rotary shear. 4,275,500, Cl. 30-40.000.

Sperry Corporation: *See*—
Bohman, Carl E.; and Mitchell, Peter G., 4,275,546, Cl. 56-10.200.
DeCoene, Frans J. G. C., 4,275,552, Cl. 56-370.000.
Kraemer, Erich H.; and Rolfs, John C., 4,276,655, Cl. 455-327.000.

Sperry Rand Corporation: *See*—
Wong, Wilson T., 4,276,607, Cl. 364-760.000.

Sprengling, Kurt, to Stanley Industrial Corporation. Composite fan blade assembly. 4,275,993, Cl. 416-207.000.

Srinivasa, Saroja R.; Shelley, Peter S.; and Hueschen, Robert E., to General Electric Company. Attachment means for a graphite x-ray tube target. 4,276,493, Cl. 313-330.000.

Srivastava, Ajit K.: *See*—
Peterson, Donald L.; Srivastava, Ajit K.; and Brown, Galen K., 4,275,649, Cl. 100-4.000.

Staar, Marcel J. H., to Panpack A.G. Package for storing and spraying small amounts of liquids. 4,275,840, Cl. 239-327.000.

Staat der Nederlanden (Staatsbedrijf der Posterijen, Telegrafie en Telefonie): *See*—
Aarsen, Jan A.; and da Silva, Herman, 4,276,653, Cl. 455-56.000.

Stager, Robert F.; and Blight, Graham J., to Brown & Root, Inc. Adjustable torque control winch system. 4,276,498, Cl. 318-6.000.

Stahler, Fritz: *See—*
Hundt, Dieter; Sedelmeyer, Marianne; Roschlau, Peter; Stahler, Fritz; and Gruber, Wolfgang, 4,276,376, Cl. 435-17.000.

Stakhov, Alexei P.; Solyanichenko, Nikolai A.; Luzheisky, Vladimir A.; Ovodenko, Alexandr V.; and Kozak, Andrei A. Fibonacci p-code parallel adder. 4,276,608, Cl. 364-768.000.

Stalzer, Kenneth R. Construction survey lath-stake base. 4,275,535, Cl. 52-100.000.

Stamicarbon, B.V.: *See—*
Verheijen, Egidius J. M.; and Geersheuvels, Charles H., 4,276,419, Cl. 546-164.000.

Stanadyne, Inc.: *See—*
Moen, Alfred M., 4,275,843, Cl. 239-499.000.

Standard Oil Company (Indiana): *See—*
Fahrig, Robert J., 4,275,763, Cl. 137-613.000.
Karayannis, Nicholas M.; Grams, Harold; and Skryantz, John S., 4,276,191, Cl. 252-429.00C.
Lawrence, Dan D.; and Felber, Betty J., 4,275,789, Cl. 166-294.000.
McHenry, Keith W., Jr., 4,276,150, Cl. 208-120.000.

Standard-Thomson Corporation: *See—*
Barker, Glenn B.; and Coburn, William K., III, 4,276,237, Cl. 261-39.00A.

Standler, Ronald B.: *See—*
Uman, Martin A.; and Standler, Ronald B., 4,276,576, Cl. 361-1.000.

Stanley, Hugh E.; and Tokos, George M., to Crown Zellerbach Corporation. Trilaminate film for forming sideweld bags. 4,276,330, Cl. 428-35.000.

Stanley Industrial Corporation: *See—*
Sprengling, Kurt, 4,275,993, Cl. 416-207.000.

Stansbeary, Jack L.: *See—*
Norton, William W.; Stansbeary, Jack L.; Clemens, Johann; and Earl, Roscoe T., 4,275,480, Cl. 17-25.000.

Stansbury, Buddy F.: *See—*
Brereton, David A.; and Stansbury, Buddy F., 4,276,595, Cl. 364-200.000.

Starcevic, Mihailo, to BBC Brown, Boveri & Company, Limited. Segment bearing in large rotary machines. 4,275,936, Cl. 308-73.000.

Starks, Marvin: *See—*
Adler, Franklin P.; and Starks, Marvin, 4,275,662, Cl. 105-377.000.

Stasko, William: *See—*
Haswell, Walter T.; Stasko, William; and Dax, F. Robert, 4,276,087, Cl. 75-243.000.

Stauffer Chemical Company: *See—*
Honig, Milton L.; and Weil, Edward D., 4,276,234, Cl. 260-982.000.
Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., 4,276,078, Cl. 71-88.000.

Stehl, Rudolph H.: *See—*
Nestrick, Terry J.; and Stehl, Rudolph H., 4,276,061, Cl. 55-67.000.

Steidl, Robert H., to Boeing Company, The. Stowage bin mechanism. 4,275,942, Cl. 312-266.000.

Stein, Marc T.: *See—*
Thompson, David L.; and Stein, Marc T., 4,275,737, Cl. 128-419.0PG.

Steinberger, Helmut: *See—*
Wieder, Wolfgang; Witte, Josef; Moretto, Hans-Heinrich; and Steinberger, Helmut, 4,276,389, Cl. 525-61.000.

Steinbrecher, Heinrich; Koch, Johannes; and Peglan, Manfred, to Wean United, Inc. Apparatus for manufacturing tubes by continuous hot rolling. 4,275,578, Cl. 72-14.000.

Stendel, Wilhelm: *See—*
Fuchs, Rainer; Hammann, Ingeborg; and Stendel, Wilhelm, 4,276,306, Cl. 424-304.000.
Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; Krehan, Ingomar; Kraus, Peter; and Stendel, Wilhelm, 4,276,310, Cl. 424-322.000.

Stephen, Michael A.: *See—*
Bench, Stephen M.; Dirkes, William R.; Juglekar, Manohar A.; Secora, James C.; and Stephen, Michael A., 4,276,651, Cl. 375-120.000.

Sterling Drug Inc.: *See—*
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,276,293, Cl. 424-248.400.

Steuer, Herbert K., to P.I.V. Antrieb Werner Reimers Kommanditgesellschaft. Chain for friction pulley transmission. 4,276,041, Cl. 474-243.000.

Stevenson, Sanford. Solar collector. 4,275,710, Cl. 126-424.000.

Stewart, Lynn: *See—*
Stewart, Mark; and Stewart, Lynn, 4,276,562, Cl. 358-86.000.

Stewart, Mark; and Stewart, Lynn. TV Switching system. 4,276,562, Cl. 358-86.000.

Stewart, Richard F.; and Kennedy, Robert W., to White-Westinghouse Corporation. Dispenser-liquid water treatment for room humidifier. 4,276,241, Cl. 261-92.000.

Sticht, Walter. Pneumatic conveyor system. 4,275,976, Cl. 406-28.000.

Stiles, Carl A.: *See—*
Johnson, Joseph S.; and Stiles, Carl A., 4,275,829, Cl. 232-17.000.

Stillwagon, Roy E., to United States of America, Energy. Homopolar machine for reversible energy storage and transfer systems. 4,276,507, Cl. 322-48.000.

Stocker, Herbert: *See—*
Bauer, Hartmut; Schmidt, Peter; Stocker, Herbert; and Przybyla, Bernd, 4,275,695, Cl. 123-486.000.

Stoller, Milton: *See—*
Quedens, Phillipp J.; Haverl, Ronald A.; and Stoller, Milton, 4,275,597, Cl. 73-618.000.

Stoltman, Donald D., to General Motors Corporation. Closed loop air-fuel ratio control system. 4,275,697, Cl. 123-520.000.

Stone, Franz T.; and Schreyer, Kenneth D., to Columbus McKinnon Corporation. Clevis type connection device. 4,275,556, Cl. 59-93.000.

Stone, Henry D.; Knapp, Alan G.; Mansell, John R.; Overall, Colin D.; and Washington, Derek, to U.S. Philips Corporation. Channel plate electron multipliers. 4,276,127, Cl. 204-24.000.

Stoveken, F. Raymond. Laminated foam-creped paper product and method of production thereof. 4,276,339, Cl. 428-153.000.

Stover, William A.: *See—*
Chester, Arthur W.; and Stover, William A., 4,276,149, Cl. 208-120.000.

Straihammer, Reinhard, to Siemens Aktiengesellschaft. Dental handpiece. 4,276,025, Cl. 433-105.000.

Stratoflex, Inc.: *See—*
Cooke, Horise M., 4,275,769, Cl. 138-109.000.

Straub, Dieter: *See—*
Gerstenberger, Friedrich; Loos, Wolfgang; and Straub, Dieter, 4,275,521, Cl. 42-84.000.

Stromberg-Carlson Corporation: *See—*
Beebe, Otto W.; Lee, Ernest O.; Subrin, Richard I.; Brightman, Barrie; and Hanson, George C., 4,276,451, Cl. 179-175.20C.

Stryker Corporation: *See—*
Phillips, Earl G.; and Ranger, Dee B., 4,276,023, Cl. 433-85.000.

Strzegowski, Joseph C., Jr.: *See—*
Hardigg, James S.; and Strzegowski, Joseph C., Jr., 4,276,360, Cl. 429-175.000.

Subrin, Richard I.: *See—*
Beebe, Otto W.; Lee, Ernest O.; Subrin, Richard I.; Brightman, Barrie; and Hanson, George C., 4,276,451, Cl. 179-175.20C.

Suchy, Milos, to Hoffmann-La Roche Inc. Cyclopropane carboxylic acid esters and cyclopropane(thio)-carboxylic acid esters. 4,276,305, Cl. 424-301.000.

Suda, Yoshio: *See—*
Asai, Michihiko; Suda, Yoshio; Imada, Kiyoshi; Ueno, Susumu; and Nomura, Hirokazu, 4,276,138, Cl. 204-165.000.

Sugihara, Akira: *See—*
Hayashi, Yoshiro; Sugihara, Akira; Shimura, Takaki; Ishikawa, Kozo; Wada, Kiyoshi; Yamanaka, Eiji; and Senba, Shunsuke, 4,276,572, Cl. 360-12.000.

Sugihara, Tetsuo, to General Company Limited. Pressure sensitive recording sheet. 4,276,334, Cl. 428-40.000.

Sugimoto, Kaname; and Yuen, Shokichi, to Hayashibara, Ken; and Ashida, Shin. Interferon and preparations containing interferon. 4,276,282, Cl. 424-85.000.

Sugimoto, Masakazu: *See—*
Masuda, Noboru; and Sugimoto, Masakazu, 4,276,499, Cl. 318-119.000.

Sugino, Tohru: *See—*
Daito, Michimasa; and Sugino, Tohru, 4,275,527, Cl. 51-103.0TF.

Sugita, Shigehisa: *See—*
Kuroda, Michio; Nakamura, Shozo; Tsukahara, Satoshi; Akatu, Yasuaki; Sugita, Shigehisa; Kaneko, Kojiro; Sakaguchi, Seiichiro; and Oshima, Ryoichiro, 4,275,563, Cl. 60-673.000.

Sullaway, Bob L.: *See—*
Knox, Lloyd C.; and Sullaway, Bob L., 4,275,974, Cl. 405-225.000.

Sullivan, William E.; and Meetze, Murray O., Jr., to Risdon Enterprises, Inc. Apparatus for inducing air flow past a product capable of being vaporized. 4,276,236, Cl. 261-30.000.

Sumegi, Robert B.: *See—*
Hatch, Robert A.; Jansen, Harvey B.; Bolliger, Frederic E.; and Sumegi, Robert B., 4,275,558, Cl. 60-39.16R.

Sumitomo Cement Co., Ltd.: *See—*
Shibuya, Kyoichi; and Ihara, Tomomi, 4,276,020, Cl. 432-14.000.

Sumitomo Chemical Company, Limited: *See—*
Ito, Takaaki; and Watanabe, Tokio, 4,276,308, Cl. 424-304.000.
Mukaiyama, Teruaki; and Sakito, Yoji, 4,276,217, Cl. 260-340.90R.

Sumitomo Industries, Ltd.: *See—*
Nagano, Hiroo; Oda, Terumi; and Fukuda, Takashi, 4,276,133, Cl. 204-145.00R.

Sumka, Elmer H.; and Shea, Henry J., to Westinghouse Electric Corp. Braking system. 4,276,500, Cl. 318-369.000.

Sundberg, Erik, to Koehler Manufacturing Company. Lead-acid battery with tubular plate electrode. 4,276,359, Cl. 429-140.000.

Sundins Fabriker AB: *See—*
Petersson, Ralf C. E., 4,275,998, Cl. 417-269.000.

Superforni Rinaldi S.p.A.: *See—*
Flavio, Rinaldi, 4,276,465, Cl. 219-388.000.

Suyama, Hideo; and Ugaji, Masana, to Sony Corporation. Membrane type electro-acoustic transducer. 4,276,452, Cl. 179-180.000.

Suzuki, Ryo, to Hitachi, Ltd. Magnetic bubble memory device with divided electrical conductors. 4,276,612, Cl. 365-12.000.

Suzuta, Mikio: *See—*
Midorikawa, Koyo; Tsunoda, Atsuo; Murase, Hidetoshi; Mochizuki, Noritaka; Minami, Setsuo; Matsui, Yoshiya; Moriwaki, Masazumi; and Suzuta, Mikio, 4,275,962, Cl. 355-1.000.

Sweatman, Ronald E., to BJ-Hughes Inc. Method of plugging a well. 4,275,788, Cl. 166-292.000.

Sweetheart Plastics, Inc.: *See—*
Davis, Paul, 4,275,815, Cl. 206-508.000.

Swenson, Edward L.; and Ratzlaff, Howard L., to Hesston Corporation. Crop baler. 4,275,550, Cl. 56-341.000.
Swinburne, Stephen: *See*—
Gelardi, Anthony; Gelardi, Paul; Swinburne, Stephen; Janiszewski, Michael; MacLeod, Robert, Jr.; Philippe, James; and Philippe, David, 4,275,943, Cl. 312-319.000.
Sybron Corporation: *See*—
Chamberlain, Alan D., 4,276,165, Cl. 210-242.100.
Westfall, Norman R., 4,275,767, Cl. 138-40.000.
Symanczyk, Hermann: *See*—
Foller, Werner; and Symanczyk, Hermann, 4,275,755, Cl. 137-195.000.
Systems Engineering & Manufacturing Corp.: *See*—
Shorr, Jacob, 4,276,176, Cl. 210-637.000.
Szabo, Ferenc: *See*—
Varga, Gabor; Szabo, Ferenc; Sztanyik, Ferenc; Vagvolgyi, Laszlo; and Nemeth, Jozsef, 4,275,594, Cl. 73-487.000.
Szarka, Istvan; and Urbantsok, Janos, to Autoipari Kutato Intezet. Controlling and operating device for friction clutches for motor vehicles. 4,275,804, Cl. 192-3.580.
Sztanyik, Ferenc: *See*—
Varga, Gabor; Szabo, Ferenc; Sztanyik, Ferenc; Vagvolgyi, Laszlo; and Nemeth, Jozsef, 4,275,594, Cl. 73-487.000.
Szymaszek, Paul G.; and Hall, Robert A., to Vilter Manufacturing Corporation. Oil cooling means for refrigeration screw compressor. 4,275,570, Cl. 62-468.000.
Tachika, Tetsuji; Sakamaki, Hisashi; and Hattori, Hiroyuki, to Canon Kabushiki Kaisha. Copying apparatus. 4,275,958, Cl. 355-14.00R.
Tadanier, John S.: *See*—
Martin, Jerry R.; Tadanier, John S.; and Collum, Paulette, 4,276,413, Cl. 536-17.00R.
Taddeo, Anthony R. Acoustic transducer system. 4,276,446, Cl. 179-1.00E.
Tai, King L.: *See*—
Heller, Adam; Tai, King L.; and Vadimsky, Richard G., 4,276,368, Cl. 430-323.000.
Takacs, Istvan: *See*—
Gyorgy, Fabry; and Takacs, Istvan, 4,276,244, Cl. 261-155.000.
Takagi, Takeshi; and Abo, Tokushi, to Matsushita Electric Works, Ltd. Wall hanging holder for electric shaver. 4,275,862, Cl. 248-205.00A.
Takagi, Taketoshi, to Japan Music Supply Inc. Plug for electric connections. 4,275,947, Cl. 339-183.000.
Takahashi, Kiyotaka: *See*—
Ando, Yoshinori; Inoue, Sakae; and Takahashi, Kiyotaka, 4,276,275, Cl. 423-345.000.
Takami, Katsumi; and Matsuzawa, Takashi, to Hitachi, Ltd. Self-luminescent light source for liquid crystal display watch. 4,276,633, Cl. 368-227.000.
Takano, Hiroshi, to Mitsuboshi Belting Ltd. Adjustless V-belt and method of manufacturing. 4,276,039, Cl. 474-205.000.
Takano, Yukio; Ogirima, Masahiko; Aoki, Shigeru; Maki, Michiyoshi; and Kato, Shigeo, to Hitachi, Ltd. Semiconductor substrate and a manufacturing method thereof. 4,276,114, Cl. 156-645.000.
Takara Co., Ltd.: *See*—
Tateyama, Masanobu, 4,275,887, Cl. 273-239.000.
Takashima, Yoshimi: *See*—
Ishikawa, Masayuki; Tanaka, Hiromichi; Eguchi, Yukuo; Ito, Shigeru; Takashima, Yoshimi; and Kobayashi, Masahiko, 4,276,295, Cl. 424-251.000.
Takayama, Yoshihiro: *See*—
Yukawa, Hideaki; Osumi, Kazuoki; Nara, Terukazu; and Takayama, Yoshihiro, 4,276,380, Cl. 435-115.000.
Takazawa, Yuzuru: *See*—
Kitai, Kiyoshi; Takazawa, Yuzuru; and Nagaoka, Shinji, 4,275,955, Cl. 354-268.000.
Takeda Chemical Industries, Ltd.: *See*—
Nakabayashi, Masamitsu; Doura, Fumihiro; and Hori, Teruo, 4,276,390, Cl. 525-61.000.
Takeda, Yuji; Shigematsu, Takashi; and Sawada, Daisaku, to Toyota Jidosha Kogyo Kabushiki Kaisha. System for controlling ignition timings in engine. 4,275,692, Cl. 123-419.000.
Takemura, Reiji: *See*—
Seko, Maomi; Ogawa, Shinsaku; and Takemura, Reiji, 4,276,130, Cl. 204-98.000.
Takeuchi, Masami: *See*—
Tominaga, Tamotsu; Mihara, Teruyoshi; Oguro, Takeshi; and Takeuchi, Masami, 4,276,533, Cl. 338-4.000.
Takeyama, Toshiro; and Ohtani, Shigemori, to Kabushikikaisha Ohkawara Seisakusho. Burner for combustion apparatus. 4,275,841, Cl. 239-431.000.
Takezawa, Mamoru: *See*—
Matsuhisa, Koh; and Takezawa, Mamoru, 4,275,969, Cl. 400-625.000.
Takimoto, Kouji: *See*—
Fujita, Teizo; Ohashi, Toshiro; and Takimoto, Kouji, 4,276,631, Cl. 368-89.000.
Taller, Robert A.: *See*—
Koleske, Joseph V.; Smith, Oliver W.; France, Haywood G.; and Taller, Robert A., 4,276,405, Cl. 528-58.000.
Tamoni, Giorgio: *See*—
Parenti, Francesco; Coronelli, Carolina; Tamoni, Giorgio; and Lancini, Giancarlo, 4,276,382, Cl. 435-253.000.
Tamura, Sadahiro: *See*—
Nishikawa, Toshio; Tamura, Sadahiro; and Ishikawa, Youhei, 4,276,525, Cl. 333-206.000.
Tanabe Seiyaku Co., Ltd.: *See*—
Ikezaki, Muneyoshi; Noguchi, Katsuyuki; Iwai, Hajime; and Inamasu, Masanori, 4,276,304, Cl. 424-282.000.
Tanaka, Akio; Nakajima, Yoshihisa; and Yokomori, Shinji, to Fuji Electric Co., Ltd. Coin sorting machine. 4,275,806, Cl. 194-100.00A.
Tanaka, Chiaki: *See*—
Mibu, Hiroaki; Ishihara, Tadashi; Tanaka, Chiaki; and Esaki, Shingo, 4,276,479, Cl. 250-492.00R.
Tanaka, Hiromichi: *See*—
Ishikawa, Masayuki; Tanaka, Hiromichi; Eguchi, Yukuo; Ito, Shigeru; Takashima, Yoshimi; and Kobayashi, Masahiko, 4,276,295, Cl. 424-251.000.
Tanaka, Kazuyoshi, to Kabushiki Kaisha Asahi Gomu. Wet suit material and wet suit made thereof. 4,276,341, Cl. 428-246.000.
Tanimoto, Akira; Masuzawa, Sigeaki; Shibata, Shinya; and Nishizaki, Shinzo, to Sharp Kabushiki Kaisha. Synthetic-speech calculators. 4,276,444, Cl. 179-1.0SM.
Tanimoto, Akira: *See*—
Inoue, Tomohiro; Tanimoto, Akira; and Washizuka, Isamu, 4,276,541, Cl. 340-146.3SY.
Tarbon, Philip B.; and Martin, Charles R., to Platt Saco Lowell Limited. Clearance-producing means for open-end spinning machine servicing apparatus. 4,275,554, Cl. 57-263.000.
Tateyama, Masanobu, to Takara Co., Ltd. Portable multiple game assembly. 4,275,887, Cl. 273-239.000.
Tauber, Arthur: *See*—
Bergner, Robert L.; Rothwarf, Frederick; and Tauber, Arthur, 4,276,097, Cl. 148-101.000.
Tavoni, Gian P.: *See*—
Baima, Mario; and Tavoni, Gian P., 4,275,523, Cl. 43-112.000.
Taylor, Lloyd D., to Polaroid Corporation. Photographic processing composition containing polymerics oxime. 4,276,370, Cl. 430-466.000.
Taylor, Raymond C.: *See*—
Eddy, William R.; and Taylor, Raymond C., 4,276,043, Cl. 493-160.000.
Taylor, Thomas K. Bilge pump. 4,275,995, Cl. 417-40.000.
Tcherepnin, Serge A.: *See*—
Eventoff, Franklin N.; and Tcherepnin, Serge A., 4,276,538, Cl. 338-69.000.
Technalytics, Inc.: *See*—
Chodorow, Ingram S.; and Dainow, J. David, 4,275,736, Cl. 128-335.000.
Technical Communications Corp.: *See*—
McCalmont, Arnold M.; and Slate, Matthew W., 4,276,652, Cl. 455-29.000.
Technicon Instruments Corporation: *See*—
Adler, Stanford L., Sr.; Gordon, Abraham; and Ornstein, Leonard, 4,276,253, Cl. 264-247.000.
Technion Research and Development Foundation Ltd.: *See*—
Zaslavsky, Dan; and Rozenberg, Lev V., 4,276,077, Cl. 71-64.0SC.
Teetzel, Michael L.; and James, Ralph E., to Minnesota Mining and Manufacturing Company. High flap density abrasive flap wheel. 4,275,529, Cl. 51-334.000.
Teijin Limited: *See*—
Ogawa, Yoshinari; Fukumoto, Teruhisa; and Sakai, Kohichi, 4,276,208, Cl. 260-28.00R.
Teja, Mohindar S. Crane or excavator with auxiliary mechanism for transferring superstructure loads to the ground. 4,275,902, Cl. 280-766.000.
Teledyne Industries, Inc.: *See*—
Elkins, Christopher W.; and Smith, David W., 4,275,908, Cl. 285-55.000.
Tellander, Linn; and Lord, Billy J. Hydromassage air injector apparatus. 4,275,713, Cl. 128-66.000.
Telling, Edward F., to Trewhella Brothers (UK) Ltd. Compacting apparatus. 4,275,650, Cl. 100-45.000.
Tenhagen, Rudolf J., to BP Chemicals Limited. Process for preparing cold-cured molded polyurethane flexible from a high molecular weight siloxane and a solvent. 4,276,385, Cl. 521-112.000.
Tension Structures, Inc.: *See*—
Pinson, Neal I., 4,275,537, Cl. 52-223.00R.
Terasawa, Koji, to Canon Kabushiki Kaisha. Ink jet mechanism for purging and activating. 4,276,554, Cl. 346-140.00R.
Terrell, Christopher: *See*—
Henson, Kenneth; and Terrell, Christopher, 4,276,358, Cl. 429-97.000.
Tessler, Martin M., to National Starch and Chemical Corporation. Novel zwitterion polygalactomannan ether derivatives and a method for the preparation thereof. 4,276,414, Cl. 536-114.000.
Texaco Inc.: *See*—
Rundell, Herbert A., 4,275,588, Cl. 73-862.320.
Texas Instruments Incorporated: *See*—
Haesly, Barry F.; and Jarman, Hall E., 4,276,460, Cl. 200-292.000.
Haggard, Roger L.; Seitchik, Jerold A.; and Rao, T. R. N., 4,276,646, Cl. 371-37.000.
Textron, Inc.: *See*—
Andrews, James R.; Balke, Rodney W.; and Berry, Victor L., 4,275,992, Cl. 416-146.00R.
Underhill, William K., Jr., 4,275,994, Cl. 416-226.000.
Thacker, Charles P.; Norman, Fielding M.; and Rider, Ronald E., to Xerox Corporation. High speed Hamming code circuit and method for the correction of error bursts. 4,276,647, Cl. 371-40.000.
Theurer, Josef; and Brunninger, Manfred, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Apparatus for operating transport vehicles movable on a track carried by a train of railroad cars. 4,275,659, Cl. 104-2.000.

Thibado, Daniel H.: *See*—
Bell, George E.; Wilson, Clement B.; Thibado, Daniel H.; and Palumbo, Kenneth S., 4,275,956, Cl. 355-3.0DD.
Thietz, Peter: *See*—
Siewert, Ingo; Klaue, Manfred; and Thietz, Peter, 4,276,109, Cl. 156-273.000.
Thoman, David C.: *See*—
Perkey, Russell C.; Thoman, David C.; and Eastman, James M., 4,276,006, Cl. 418-94.000.
Thomas Industries, Inc.: *See*—
Hetzel, Thomas R.; and LaBelle, Charles, 4,275,999, Cl. 417-299.000.
Thomas, Robert R.: *See*—
Hopkins, Evan L.; and Thomas, Robert R., 4,275,476, Cl. 15-236.00R.
Thompson, Charles M.; and Thompson, Charles T., to American Coldset Corp. Drilling stabilizer. 4,275,935, Cl. 308-4.00A.
Thompson, Charles T.: *See*—
Thompson, Charles M.; and Thompson, Charles T., 4,275,935, Cl. 308-4.00A.
Thompson, David L.; and Stein, Marc T., to Medtronic, Inc. Demand cardiac pacemaker having reduced polarity disparity. 4,275,737, Cl. 128-419.0PG.
Thornton, Aaron R.; and Obenour, Jerry, to Wisconsin Alumni Research Foundation. Auditory response detection method and apparatus. 4,275,744, Cl. 128-731.000.
Thornton-Trump, Walter E. Specific gravity meter for aircraft de-icing equipment. 4,275,593, Cl. 73-454.000.
Thorsted, Kenneth G.: *See*—
Pennington, John W., III; and Thorsted, Kenneth G., 4,275,680, Cl. 114-295.000.
Thurston, Marlin O.: *See*—
Gilson, Richard D.; Thurston, Marlin O.; Olson, Karl W.; and Ventola, Ronald W., 4,276,029, Cl. 434-43.000.
Tietjens, Eduard W.: *See*—
Engelhardt, Manfred; Reinink, Jan; De Vries, Jochem J.; Trees, Ferdinand M.; Tietjens, Eduard W.; and Groothuis, Gerrit J., 4,275,497, Cl. 30-43.600.
Tisdale, Bert B. Grain auger hopper. 4,275,780, Cl. 150-52.00R.
Tokos, George M.: *See*—
Stanley, Hugh E.; and Tokos, George M., 4,276,330, Cl. 428-35.000.
Tokuda, Hiroatsu; Morinaga, Shigeki; and Nakamura, Hideo, to Hitachi, Ltd. Electronic engine control apparatus. 4,276,601, Cl. 364-431.000.
Tokuda, Hiroatsu: *See*—
Obara, Sanshiro; Tokuda, Hiroatsu; Konno, Akihiko; and Nakamura, Hideo, 4,276,602, Cl. 364-431.000.
Tokushige, Yuji: *See*—
Sato, Yasuhiko; Koizumi, Jun; and Tokushige, Yuji, 4,276,135, Cl. 204-159.130.
Tokyo Ohka Kogyo Kabushiki Kaisha: *See*—
Tsuda, Minoru; and Nakamura, Yoichi, 4,276,369, Cl. 430-326.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Fukuda, Takeo; Murayama, Tadashi; and Urui, Kiyoshi, 4,276,639, Cl. 370-62.000.
Kageyama, Hiroshi; and Saito, Tsuyoshi, 4,275,814, Cl. 206-455.000.
Okamoto, Eiichi; Fujisawa, Norio; and Hori, Masao, 4,276,605, Cl. 364-483.000.
Yamashita, Mitsuo; and Kondo, Osamu, 4,275,879, Cl. 271-259.000.
Tolley, William K.; Laughlin, William C.; and Rostoker, William, to UOP Inc. Recovery of metal values from a metal bearing source of nickel and vanadium. 4,276,083, Cl. 75-82.000.
Tomasi, Jean-Pierre, to U.S. Philips Corporation. FM-CW Radar distance measuring apparatus. 4,276,549, Cl. 343-7.500.
Tominaga, Shigetake: *See*—
Yoshimura, Tatsushiro; and Tominaga, Shigetake, 4,276,214, Cl. 260-45.75K.
Tominaga, Tamotsu; Mihara, Teruyoshi; Oguro, Takeshi; and Takeuchi, Masami, to Nissan Motor Company, Limited. Pressure sensor. 4,276,533, Cl. 338-4.000.
Tomita, Yoshifumi: *See*—
Manabe, Toshikatsu; Nonogaki, Saburo; Morishita, Hajime; Uchino, Shoichi; Tomita, Yoshifumi; Nishizawa, Masahiro; Yokomizo, Hiroshi; and Ohmatoi, Susumu, 4,276,363, Cl. 430-28.000.
Tomlinson, Geoffrey E. S., to White-BSA Tools Ltd. Multi-spindle lathes. 4,275,625, Cl. 82-25.000.
Tomlinson, Lloyd R., to Boeing Company, The. Midvalue signal selection and fault detection apparatus and method. 4,276,648, Cl. 371-68.000.
Tompkins, Russell E.; Walden, John P.; and Walker, Loren H., to General Electric Company. Apparatus for sensing current transformer primary current as a function of differential core inductance. 4,276,510, Cl. 324-127.000.
Toombs, Gary C.: *See*—
Gallusser, David O.; Hemmer, Valentine J.; and Toombs, Gary C., 4,275,948, Cl. 339-218.00R.
Topp, Bernhard; Friese, Karl-Hermann; and Haecker, Wolf-Dieter, to Robert Bosch GmbH. Electrochemical sensor, particularly for internal combustion engine exhaust gas composition determination, and method of its manufacture. 4,276,142, Cl. 204-195.00S.
Toray Industries, Inc.: *See*—
Nishino, Masaki; and Yasuhara, Yutaka, 4,276,228, Cl. 260-453.0AL.
Torisawa, Akira: *See*—
Satoh, Katsuhiko; Asano, Kazuhiro; Mandai, Masaaki; Ueda, Makoto; Torisawa, Akira; and Shida, Masaharu, 4,276,626, Cl. 368-80.000.
Toyama, Kenji: *See*—
Kanzaki, Nobuyoshi; Toyama, Kenji; Nakano, Katsutoshi; Shimatani, Ryoichi; and Kudo, Fumio, 4,276,129, Cl. 204-58.000.
Toyo Seikan Kaisha Limited: *See*—
Mouri, Takenori; Morimoto, Kengi; Yoshimoto, Itaru; Kayama, Hiroyki; Okazawa, Yukio; and Sizukuisi, Touru, 4,275,648, Cl. 99-483.000.
Toyoda, Kenji: *See*—
Watanabe, Sakuji; Ohtsubo, Yoshiaki; and Toyoda, Kenji, 4,275,953, Cl. 354-33.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Sakamaki, Hiroshi; Maeda, Toshiyuki; Ushijima, Fumihiro; and Saitou, Tadashi, 4,276,007, Cl. 418-152.000.
Takeda, Yuji; Shigematsu, Takashi; and Sawada, Daisaku, 4,275,692, Cl. 123-419.000.
Yoshida, Toshiro; and Kumai, Teruo, 4,275,696, Cl. 123-519.000.
Traber, Walter: *See*—
Brechbuhler, Hans U.; Mattern, Gunter; and Traber, Walter, 4,276,302, Cl. 424-273.00R.
Trees, Ferdinand M.: *See*—
Engelhardt, Manfred; Reinink, Jan; De Vries, Jochem J.; Trees, Ferdinand M.; Tietjens, Eduard W.; and Groothuis, Gerrit J., 4,275,497, Cl. 30-43.600.
Tresser, David: *See*—
Padley, Frederick B.; Paulussen, Cornelis N.; Soeters, Cornelis; and Tresser, David, 4,276,322, Cl. 426-660.000.
Trewhella Brothers (UK) Ltd.: *See*—
Telling, Edward F., 4,275,650, Cl. 100-45.000.
Troglin, Jerry D. Gasoline vapor complete burning carburetor. 4,275,699, Cl. 123-557.000.
Troponwerke GmbH & Co., KG: *See*—
Etschenberg, Eugen; Opitz, Wolfgang; and Raddatz, Siegfried, 4,276,288, Cl. 424-177.000.
Troy Chemical Corporation: *See*—
Singer, William; Nowak, Milton; and Ingles, Norma, 4,276,211, Cl. 260-29.6MN.
Trutzschler GmbH & Co. KG: *See*—
Leifeld, Ferdinard, 4,275,482, Cl. 19-150.000.
TRW Inc.: *See*—
Davidheiser, Roger A., 4,276,521, Cl. 332-23.00R.
Hayden, Rodney, 4,276,483, Cl. 307-10.00R.
Huang, Marshall Y., 4,276,514, Cl. 330-149.000.
Miller, Ralph W.; and Peterson, James G., 4,276,543, Cl. 340-347.0AD.
Tsuda, Minoru; and Nakamura, Yoichi, to Tokyo Ohka Kogyo Kabushiki Kaisha. Photo—imaging a polymethyl isopropenyl ketone (PMIPK) composition. 4,276,369, Cl. 430-326.000.
Tsukahara, Satoshi: *See*—
Kuroda, Michio; Nakamura, Shozo; Tsukahara, Satoshi; Akatu, Yasuaki; Sugita, Shigehisa; Kaneko, Kojiro; Sakaguchi, Seiichiro; and Oshima, Ryoichiro, 4,275,563, Cl. 60-673.000.
Tsunoda, Atsuo: *See*—
Midorikawa, Koyo; Tsunoda, Atsuo; Murase, Hidetoshi; Mochizuki, Noritaka; Minami, Setsuo; Matsui, Yoshiya; Moriwaki, Masazumi; and Suzuta, Mikio, 4,275,962, Cl. 355-1.000.
Turner, Clara: *See*—
Bolton, Colin B.; Rylands, Harry D.; Turner, Clara; and Turner, Henry W., 4,275,858, Cl. 244-121.000.
Turner, Donald M.; and Smith, Richard, to Avon Rubber Company Limited. Testing rubber. 4,275,600, Cl. 73-843.000.
Turner, Henry W.: *See*—
Bolton, Colin B.; Rylands, Harry D.; Turner, Clara; and Turner, Henry W., 4,275,858, Cl. 244-121.000.
Turner, Robert L.: *See*—
Khanna, Ram-Tirth; and Turner, Robert L., 4,276,212, Cl. 260-39.00R.
Turner, Ronald F., to Lucas Industries Limited. Fluid control valves. 4,275,865, Cl. 251-63.000.
Turner, Ronald L.: *See*—
Kindig, James K.; and Turner, Ronald L., 4,276,081, Cl. 75-7.000.
Twin Disc, Incorporated: *See*—
Snoy, Joseph B., 4,275,607, Cl. 74-15.630.
Uchino, Shoichi: *See*—
Manabe, Toshikatsu; Nonogaki, Saburo; Morishita, Hajime; Uchino, Shoichi; Tomita, Yoshifumi; Nishizawa, Masahiro; Yokomizo, Hiroshi; and Ohmatoi, Susumu, 4,276,363, Cl. 430-28.000.
Uddeholms Aktiebolag: *See*—
Wisell, Henry L., 4,276,085, Cl. 75-126.00C.
Ueda, Makoto: *See*—
Satoh, Katsuhiko; Asano, Kazuhiro; Mandai, Masaaki; Ueda, Makoto; Torisawa, Akira; and Shida, Masaharu, 4,276,626, Cl. 368-80.000.
Uehara, Tsutomu: *See*—
Hisazumi, Nobuyuki; Yamamoto, Masataka; and Uehara, Tsutomu, 4,275,544, Cl. 53-433.000.
Ueno, Susumu: *See*—
Asai, Michihiko; Suda, Yoshio; Imada, Kiyoshi; Ueno, Susumu; and Nomura, Hirokazu, 4,276,138, Cl. 204-165.000.
Uesugi, Kyozo, to Minolta Camera Kabushiki Kaisha. Compact zoom lens barrel with high zooming ratio. 4,275,952, Cl. 350-429.000.

Ugaji, Masana: *See*—
Suyama, Hideo; and Ugaji, Masana, 4,276,452, Cl. 179-180.000.
Uman, Martin A.; and Standler, Ronald B., to Lightning Location and Protection, Inc. Lightning activated relay. 4,276,576, Cl. 361-1.000.
Unarco Industries, Inc.: *See*—
Crone, Jerry L., 4,275,868, Cl. 251-310.000.
Underhill, William K., Jr., to Textron, Inc. Roll formed blade structure. 4,275,994, Cl. 416-226.000.
Unimation, Inc.: *See*—
Engelberger, Joseph F.; Lindbom, Torsten H.; Dunne, Maurice J.; Perzley, William; Roberts, Wilbur N.; and Gardner, Horace L., 4,275,986, Cl. 414-730.000.
Union Carbide Corporation: *See*—
Barr, John B.; and White, Nicholas F., III, 4,276,278, Cl. 423-447.400.
Breider, Edmund J.; and Drnevich, Raymond F., 4,276,174, Cl. 210-613.000.
Koerwer, John F., 4,276,080, Cl. 71-108.000.
Koleske, Joseph V.; Smith, Oliver W.; France, Haywood G.; and Taller, Robert A., 4,276,405, Cl. 528-58.000.
Lee, Young-Jin, 4,276,229, Cl. 260-453.0RW.
Union Chimique et Industrielle de l'Ouest S.A.: *See*—
Moran, Francis, 4,276,089, Cl. 106-14.120.
Union Special Corporation: *See*—
Boser, Ronald J.; Watts, Henry J.; and Siegel, Walter P., deceased, 4,275,673, Cl. 112-105.000.
Uniroyal, Inc.: *See*—
Brewer, Arthur D.; Neidermyer, Robert W.; and McIntire, William S., 4,276,422, Cl. 549-15.000.
Uniroyal Ltd.: *See*—
Brewer, Arthur D.; Neidermyer, Robert W.; and McIntire, William S., 4,276,422, Cl. 549-15.000.
United Centrifugal Pumps: *See*—
Murray, John T., 4,275,624, Cl. 82-1.200.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Bolton, Colin B.; Rylands, Harry D.; Turner, Clara; and Turner, Henry W., 4,275,858, Cl. 244-121.000.
Keen, John M.; and Willoughby, Arthur F. W., 4,276,099, Cl. 148-187.000.
United States Gypsum Company: *See*—
Orals, David L.; and Bushey, Peter S., 4,275,541, Cl. 52-483.000.
United States of America
Agriculture: *See*—
Peterson, Donald L.; Srivastava, Ajit K.; and Brown, Galen K., 4,275,649, Cl. 100-4.000.
Air Force: *See*—
Bergsten, M. Brian, 4,275,857, Cl. 244-53.00B.
Bleday, Michael P., 4,275,859, Cl. 244-121.000.
Army: *See*—
Bergner, Robert L.; Rothwarf, Frederick; and Tauber, Arthur, 4,276,097, Cl. 148-101.000.
Costantino, Joseph A.; Heberley, Jeffrey R.; Neimark, Jerry; and Weiner, Thomas E., 4,276,472, Cl. 250-214.00B.
Gottron, Richard N.; and Cox, Lyndon S., 4,275,658, Cl. 102-210.000.
Energy: *See*—
Aldridge, Frederick T., 4,276,060, Cl. 55-67.000.
Bentley, Glenn E.; and Barnes, John W., 4,276,267, Cl. 423-2.000.
Lackey, Walter J.; Lowrie, Robert S.; and Sease, John D., 4,276,063, Cl. 55-84.000.
McIsaac, Lyle D.; Krupa, Joseph F.; and Schroeder, Norman C., 4,276,235, Cl. 260-990.000.
Robinson, Paul R.; and Bamberger, Carlos E., 4,276,279, Cl. 423-648.00R.
Stillwagon, Roy E., 4,276,507, Cl. 322-48.000.
Vollhardt, Kurt P. C.; and Perkins, Patrick, 4,276,395, Cl. 525-332.000.
Health, Education & Welfare: *See*—
Leighton, Stephen B.; Murano, Genesio; Markowitz, Allen; and Chikadel, Burt, 4,276,383, Cl. 435-291.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Allcock, Harry R.; O'Brien, John P.; Scopelianos, Angelo G.; and Fewell, Larry L. Process for the preparation of polycarboranylphosphazenes. 4,276,403, Cl. 528-4.000.
National Aeronautics and Space Administration: *See*—
Schaefer, Gustave J., 4,276,553, Cl. 343-112.00R.
Navy: *See*—
Colvin, Robert E.; Douda, Bernard E.; Montgomery, Francis E.; and Short, James E., Jr., 4,276,100, Cl. 149-109.600.
Ferguson, Gerald D., 4,276,518, Cl. 331-94.50C.
Pennington, John W., III; and Thorsted, Kenneth G., 4,275,680, Cl. 114-295.000.
U.S. Environmental Protection Agency: *See*—
Lyon, David; and Moss, Gerald, 4,276,062, Cl. 55-77.000.
U.S. Philips Corporation: *See*—
Boekhorst, Antonius, 4,276,586, Cl. 363-21.000.
de Jager, Frank; van Doorn, Rudolf A.; Verboom, Johannes V.; and Carasso, Marino G., 4,276,650, Cl. 375-110.000.
Engelhardt, Manfred; Reinink, Jan; De Vries, Jochem J.; Trees, Ferdinand M.; Tietjens, Eduard W.; and Groothuis, Gerrit J., 4,275,497, Cl. 30-43.600.
Eshraghian, Kamran; and Bogner, Robert E., 4,276,539, Cl. 340-38.00L.
Groenendaal, Gradus C.; and Aagaard, Einar A., 4,276,649, Cl. 371-55.000.
Heinzerling, Jurgen; and Rieckeheer, Rainer, 4,276,529, Cl. 335-300.000.
Jansen, Pierre G.; and Kessels, Jozef L. W., 4,276,611, Cl. 364-900.000.
Stone, Henry D.; Knapp, Alan G.; Mansell, John R.; Overall, Colin D.; and Washington, Derek, 4,276,127, Cl. 204-24.000.
Tomasi, Jean-Pierre, 4,276,549, Cl. 343-7.500.
van Roosmalen, Johannes H. T.; and Vrijssen, Gerardus A. H. M., 4,276,494, Cl. 313-479.000.
United States Surgical Corporation: *See*—
Noiles, Douglas G., 4,275,813, Cl. 206-339.000.
United Technologies Corporation: *See*—
Snitzer, Elias; Anschutz, Donald E.; and Fox, Edward V., Jr, 4,275,965, Cl. 356-375.000.
University of Akron, The: *See*—
Kennedy, Joseph P.; Smith, Robert A.; and Ross, Louis R., Jr., 4,276,394, Cl. 525-245.000.
University of Missouri, The Curators of the: *See*—
Hahn, Allen W.; Nichols, Michael F.; Sharma, Ashok K.; and Hellmuth, Eckhard W., 4,276,144, Cl. 204-195.00P.
UOP Inc.: *See*—
Carlson, David H. J., 4,276,194, Cl. 252-430.000.
Gillespie, George A., 4,276,265, Cl. 422-311.000.
Tolley, William K.; Laughlin, William C.; and Rostoker, William, 4,276,083, Cl. 75-82.000.
Updyke, Kenneth W.: *See*—
Grgurich, William A.; Niles, Albert B.; and Updyke, Kenneth W., 4,275,844, Cl. 239-533.300.
Upjohn Company, The: *See*—
Dolak, Lester A.; Laborde, Alice L.; and Castle, Thomas M., 4,276,412, Cl. 536-17.00R.
Sih, John C., 4,276,427, Cl. 560-53.000.
Sih, John C., 4,276,428, Cl. 560-53.000.
Sih, John C., 4,276,434, Cl. 564-98.000.
Sih, John C., 4,276,435, Cl. 564-98.000.
Sih, John C., 4,276,436, Cl. 564-98.000.
Smith, Herman W., 4,276,429, Cl. 560-55.000.
Urbantsok, Janos: *See*—
Szarka, Istvan; and Urbantsok, Janos, 4,275,804, Cl. 192-3.580.
Urui, Kiyoshi: *See*—
Fukuda, Takeo; Murayama, Tadashi; and Urui, Kiyoshi, 4,276,639, Cl. 370-62.000.
Ushijima, Fumihiro: *See*—
Sakamaki, Hiroshi; Maeda, Toshiyuki; Ushijima, Fumihiro; and Saitou, Tadashi, 4,276,007, Cl. 418-152.000.
Usugi, Kikuo, to Clarion Co., Ltd. Electronic attenuator apparatus. 4,276,508, Cl. 323-354.000.
USV Pharmaceutical Corporation: *See*—
St. Georgiev, Vasil; Loev, Bernard; Mack, Robert; and Musser, John, 4,276,292, Cl. 424-248.400.
Utagawa, Ken, to Nippon Kogaku K.K. Focus detecting device. 4,276,471, Cl. 250-201.000.
Utter, Gary N.. See—
Schwartz, Robert E.; Neff, Laurence M.; and Utter, Gary N., 4,275,475, Cl. 15-104.06R.
Vadimsky, Richard G.: *See*—
Heller, Adam; Tai, King L.; and Vadimsky, Richard G., 4,276,368, Cl. 430-323.000.
Vagvolgyi, Laszlo: *See*—
Varga, Gabor; Szabo, Ferenc; Sztanyik, Ferenc; Vagvolgyi, Laszlo; and Nemeth, Jozsef, 4,275,594, Cl. 73-487.000.
Vahlbrauk, Karl H. Wall element for a construction wall. 4,275,536, Cl. 52-220.000.
Vaillancourt, Vincent L., to Critikon, Inc. Vented flexible filtration device for use in administering parenteral liquids. 4,276,170, Cl. 210-436.000.
Valleylab, Inc.: *See*—
Mitchiner, Robert K., 4,275,734, Cl. 128-303.100.
VanBuren, Martin F.: *See*—
Chromecek, Richard C.; Deichert, William G.; Falcetta, Joseph J.; and VanBuren, Martin F., 4,276,402, Cl. 526-264.000.
van der Lely, Cornelis. Haymaking machines. 4,275,551, Cl. 56-370.000.
van Doorn, Rudolf A.: *See*—
de Jager, Frank; van Doorn, Rudolf A.; Verboom, Johannes V.; and Carasso, Marino G., 4,276,650, Cl. 375-110.000.
Van Doren, Bernard M., to Ets Van Doren. Ties for the mouthpiece of a wind instrument. 4,275,636, Cl. 84-383.00R.
Van Fossen, Harvey G., to Wheelabrator-Frye, Inc. Abrasive particle blast apparatus for surface treatment. 4,275,531, Cl. 51-425.000.
Van Hook, James P.; Hildebrand, Clair E.; and Chan, Chong H., to Allied Chemical Corporation. Process for nitrite production. 4,276,276, Cl. 423-385.000.
van Roosmalen, Johannes H. T.; and Vrijssen, Gerardus A. H. M., to U.S. Philips Corporation. Cathode ray tube with transversely supported electrode and conductive wall coating. 4,276,494, Cl. 313-479.000.
van Staveren, Hendricus C.: *See*—
Oosterling, Pieter A.; and van Staveren, Hendricus C., 4,275,547, Cl. 56-13.600.
Vaponics Inc.: *See*—
Smith, Verity C., 4,276,177, Cl. 210-638.000.
Vapor Corporation: *See*—
Reddy, Redreddy S., 4,275,664, Cl. 105-430.000.

Varco, Inc.: *See*—
Elliott, Harry S., 4,276,502, Cl. 318-565.000.

Varga, Gabor; Szabo, Ferenc; Sztanyik, Ferenc; Vagvolgyi, Laszlo; and Nemeth, Jozsef, to Csepel Muvek Hiradastechnikai Gepgyara. Workpiece clamping device. 4,275,594, Cl. 73-487.000.

Varian Associates, Inc.: *See*—
Bassan, Benjamin, 4,276,005, Cl. 418-13.000.
Enge, Harald A., 4,276,477, Cl. 250-398.000.

Varma, Indra K.; Fohlen, George M.; Parker, John A.; and Frosch, Robert A. Phosphorus-containing bisimide resins. 4,276,344, Cl. 428-260.000.

Vartuli, James C.; and Zehner, Lee R., to Atlantic Richfield Company. Preparation of a titanium promoted $VO(PO_3)_2$ oxidation catalyst. 4,276,197, Cl. 252-435.000.

Vasishth, Ramesh C.; and deSilva, Dodwell P., to Envirosol Systems International, Ltd. Wood treatment process and product thereof. 4,276,329, Cl. 427-393.000.

Vassiliadis, Arthur, to Rodenstock Instruments Corporation. Apparatus and method for determining the refractive characteristics of a test lens. 4,275,964, Cl. 356-125.000.

Vautherin, Daniel A.: *See*—
Lager, Jean-Paul; and Vautherin, Daniel A., 4,276,645, Cl. 371-36.000.

Vazquez-Cuervo, Alfonso: *See*—
McNamee, James W.; Homstad, Gerald E.; Vazquez-Cuervo, Alfonso; and Henry, Kenneth J., 4,276,640, Cl. 370-77.000.

Veal, Christopher J.; and Wall, Derek R., to British Petroleum Company Limited, The. Fuel composition and method for its preparation. 4,276,053, Cl. 44-51.000.

Ventola, Ronald W.: *See*—
Gilson, Richard D.; Thurston, Marlin O.; Olson, Karl W.; and Ventola, Ronald W., 4,276,029, Cl. 434-43.000.

Verboom, Johannes V.: *See*—
de Jager, Frank; van Doorn, Rudolf A.; Verboom, Johannes V.; and Carasso, Marino G., 4,276,650, Cl. 375-110.000.

Verheijen, Egidius J. M.; and Geersheuvels, Charles H., to Stamicarbon, B.V. Process for the preparation of C-substituted pyridines and/or hydrogenated C-substituted pyridines, C-substituted quinolines and/or hydrogenated quinolines. 4,276,419, Cl. 546-164.000.

Verkade, John G., to Iowa State University Research Foundation, Inc. Converting homogeneous to heterogeneous catalysts. 4,276,195, Cl. 252-431.00P.

Vernitron Corporation: *See*—
Saldinger, Neil N., 4,276,490, Cl. 310-184.000.

Vesco, Mario: *See*—
Andreoli, Angelo; Boano, Adolfo; and Vesco, Mario, 4,275,900, Cl. 280-710.000.

Vial, Friedrich: *See*—
Knapstein, Bruno; and Vial, Friedrich, 4,275,850, Cl. 241-57.000.

Victor Company of Japan, Limited: *See*—
Kitamura, Masatsugu; Onoye, Hideo; and Yamazaki, Masami, 4,276,604, Cl. 364-480.000.
Watanabe, Yasuaki; Okabe, Yukio; Kojima, Shinichi; and Sato, Mitsuya, 4,276,560, Cl. 358-28.000.

Vilter Manufacturing Corporation: *See*—
Szymaszek, Paul G.; and Hall, Robert A., 4,275,570, Cl. 62-468.000.

Vinal, Albert W., to International Business Machines Corporation. Controlled avalanche voltage transistor and magnetic sensor. 4,276,555, Cl. 357-13.000.

Vogelpohl, David R.: *See*—
Embree, Milton L.; Goldthorp, David C.; and Vogelpohl, David R., 4,276,448, Cl. 179-84.00T.

Vollhardt, Kurt P. C.; and Perkins, Patrick, to United States of America, Energy. Novel Fischer-Tropsch catalysts. 4,276,395, Cl. 525-332.000.

Volt Delta Resources, Inc.: *See*—
Dissly, Donald D.; and Blanchard, Ronald J., 4,276,597, Cl. 364-300.000.

von Haas, Rainer, to Wilhelm Fette GmbH, Firma. Device for automatic measurement for engagement pitch of the thread on screw-like work pieces. 4,275,507, Cl. 33-199.00B.

Vosteen, Bernhard: *See*—
Schnegg, Peter; Rapp, Walter; and Vosteen, Bernhard, 4,276,431, Cl. 560-67.000.

Vrijssen, Gerardus A. H. M.: *See*—
van Roosmalen, Johannes H. T.; and Vrijssen, Gerardus A. H. M., 4,276,494, Cl. 313-479.000.

Vuissoz, Constant. Apparatus for central heating. 4,275,704, Cl. 126-92.00R.

W. H. Porter, Inc.: *See*—
Porter, William H., 4,275,534, Cl. 52-82.000.

W. R. Grace & Co.: *See*—
Reppert, Merlyn R., 4,275,931, Cl. 301-37.00R.

Wachter, Michael P.: *See*—
Hajos, Zoltan G.; and Wachter, Michael P., 4,276,216, Cl. 260-340.600.

Wacker-Chemie GmbH: *See*—
Burkhardt, Jurgen; and Louis, Eckhart, 4,276,425, Cl. 556-460.000.
Kreis, Gerhard; and Wegehaupt, Karl-Heinrich, 4,276,252, Cl. 264-222.000.
Lindner, Tassilo; Zeller, Norbert; Frey, Volker; Riedle, Rudolf; John, Peter; and Engelsberger, Georg, 4,276,426, Cl. 556-479.000.
Muller, Horst; and Frey, Volker, 4,276,423, Cl. 556-411.000.

Wada, Kiyoshi: *See*—
Hayashi, Yoshiro; Sugihara, Akira; Shimura, Takaki; Ishikawa, Kozo; Wada, Kiyoshi; Yamanaka, Eiji; and Senba, Shunsuke, 4,276,572, Cl. 360-12.000.

Wagner, Thomas J.: *See*—
Nguyen, Thanh V.; and Wagner, Thomas J., 4,276,319, Cl. 426-574.000.

Wakabayashi, Hiroshi, to Nippon Kogaku K.K. Film take-up spool. 4,275,855, Cl. 242-71.200.

Walden, John P.: *See*—
Tompkins, Russell E.; Walden, John P.; and Walker, Loren H., 4,276,510, Cl. 324-127.000.

Waldhauser, Kurt, to Ing. Waldhauser Maschinenfabrik Ges.m.b.H. & Co. KG. Duct assembly for rotor-powered mobile sprinkler. 4,275,761, Cl. 137-595.000.

Waldmeier, Othmar E. Package for diamonds and other precious stones. 4,275,810, Cl. 206-45.340.

Walker, Loren H.: *See*—
Tompkins, Russell E.; Walden, John P.; and Walker, Loren H., 4,276,510, Cl. 324-127.000.

Wall, Derek R.: *See*—
Veal, Christopher J.; and Wall, Derek R., 4,276,053, Cl. 44-51.000.

Walter, James. Hand tool. 4,275,623, Cl. 81-126.000.

Wand, Bruce, to Becton, Dickinson and Company. Protective shield for capillary pipette. 4,275,591, Cl. 73-425.40P.

Wang, Frederick E. Energy conversion system. 4,275,561, Cl. 60-527.000.

Warmetechnik Dr. Pauli GmbH & Co. Betriebs KG: *See*—
Pauli, Balduin L., 4,275,706, Cl. 126-163.00R.

Warncke, Ernst; and Pasternack, Adalbert, to Dragerwerk Aktiengesellschaft. Warning device for breathing apparatus having a pressure gas supply. 4,275,723, Cl. 128-202.220.

Warner-Lambert Company: *See*—
Brown, Richard E.; Puchalski, Chester; and Shavel, John, Jr., 4,276,296, Cl. 424-256.000.
Ciaffone, John T., 4,275,498, Cl. 30-47.000.

Warrin, George E., to Cavitron Corporation. Control systems for dental handpieces. 4,276,024, Cl. 433-99.000.

Warwicker, Peter G., to Lucas Industries Limited. Liquid fuel pumping apparatus. 4,276,000, Cl. 417-302.000.

Wasa, Kiyotaka: *See*—
Mitsuyu, Tsuneo; Wasa, Kiyotaka; and Hayakawa, Shigeru, 4,276,535, Cl. 338-22.00R.

Washington, Derek: *See*—
Stone, Henry D.; Knapp, Alan G.; Mansell, John R.; Overall, Colin D.; and Washington, Derek, 4,276,127, Cl. 204-24.000.

Washizuka, Isamu: *See*—
Inoue, Tomohiro; Tanimoto, Akira; and Washizuka, Isamu, 4,276,541, Cl. 340-146.3SY.

Watanabe, Kazuo: *See*—
Ienaka, Masanori; Yamamura, Masahiro; Watanabe, Kazuo; and Kominami, Yasuo, 4,276,442, Cl. 179-1.00A.

Watanabe, Sakuji; Ohtsubo, Yoshiaki; and Toyoda, Kenji, to Nippon Kogaku K.K. Exposure parameter information generating circuit in a single lens reflex camera. 4,275,953, Cl. 354-33.000.

Watanabe, Tokio: *See*—
Ito, Takaaki; and Watanabe, Tokio, 4,276,308, Cl. 424-304.000.

Watanabe, Yasuaki; Okabe, Yukio; Kojima, Shinichi; and Sato, Mitsuya, to Hitachi, Ltd.; and Victor Company of Japan, Limited. Color signal reproducing system and circuit for the same. 4,276,560, Cl. 358-28.000.

Waterman, David K.: *See*—
Atwood, John E.; Baugh, John L.; Koehler, William M.; and Waterman, David K., 4,275,592, Cl. 73-432.00R.

Waters Associates, Inc.: *See*—
Nelson, Kenneth E., 4,276,475, Cl. 250-373.000.

Watson, John B.; and Dodds, Philip J., to Independent Broadcasting Authority. Television systems. 4,276,564, Cl. 358-139.000.

Watson, Robert M., to AccuRay Corporation. Sensor position independent material property determination using radiant energy. 4,276,480, Cl. 250-560.000.

Watson, Roy W. Shield device and roof structure containing same. 4,275,532, Cl. 52-15.000.

Watts, Henry J.: *See*—
Boser, Ronald J.; Watts, Henry J.; and Siegel, Walter P., deceased, 4,275,673, Cl. 112-105.000.

Wean United, Inc.: *See*—
Steinbrecher, Heinrich; Koch, Johannes; and Peglan, Manfred, 4,275,578, Cl. 72-14.000.

Webb, Alexander, Sr. Portable garbage disposal unit. 4,275,848, Cl. 241-46.00B.

Weber, Joseph A., to Gustafson, Inc. Peanut seed treating machine. 4,275,682, Cl. 118-303.000.

Weese, Charles W. Ore sample crusher. 4,275,851, Cl. 241-169.000.

Wegehaupt, Karl-Heinrich: *See*—
Kreis, Gerhard; and Wegehaupt, Karl-Heinrich, 4,276,252, Cl. 264-222.000.

Weibler, Walter W.: *See*—
Orlowski, Gerald J.; Wicklund, Rodney D.; Sandlas, Richard D.; and Weibler, Walter W., 4,276,318, Cl. 426-513.000.

Weil, Edward D.: *See*—
Honig, Milton L.; and Weil, Edward D., 4,276,234, Cl. 260-982.000.

Weiner, Thomas E.: *See*—
Costantino, Joseph A.; Heberley, Jeffrey R.; Neimark, Jerry; and Weiner, Thomas E., 4,276,472, Cl. 250-214.00B.

Weir, W. David; and Kilbourn, Edward E., to Rohm and Haas Company. Phosphonoureide and phosphonothioureide anthelmintics. 4,276,290, Cl. 424-200.000.

Wellendorf, Klaus; and Sing, Gerhard, to Dr.-Ing Rudolf Hell GmbH. Recording line elements. 4,276,567, Cl. 358-280.000.

Wells, Thomas R.: *See*—
Rady, Bruce A.; Wells, Thomas R.; and Hendrickson, Kenneth, 4,276,470, Cl. 235-463.000.

Wellwood, James J.: *See*—
Anderson, Carl R.; Wellwood, James J.; and Happ, Lawrence R., 4,275,888, Cl. 369-74.000.

Welschof, Hans-Heinrich, to Lohr & Bromkamp. Homokinetic universal joint. 4,275,571, Cl. 64-21.000.

Welsh, Jay Y.; Mullier, Alain; and Picquet, Pierre C., to Chemetals Corporation. Process for preparing manganese nitrate solution. 4,276,268, Cl. 423-49.000.

Wendel, Kurz H.: *See*—
Kreuz, Ulrich H.; and Wendel, Kurz H., 4,275,853, Cl. 241-294.000.

Wernicke, Ubbo; Matejec, Reinhart; and Moll, Franz, to AGFA-Gevaert, A.G. Photographic material with interimage effect. 4,276,372, Cl. 430-505.000.

West Electric Co., Ltd.: *See*—
Yako, Hikoya, 4,276,579, Cl. 362-5.000.

Westeel-Rosco Limited-Westeel-Rosco Limitee: *See*—
Mills, Roy H., 4,275,492, Cl. 29-426.500.

Western Company of North America, The: *See*—
Beirute, Robert M., 4,276,182, Cl. 252-8.55R.

Western Electric Company, Inc.: *See*—
Gellatly, John S.; and Richter, Fred T., 4,276,108, Cl. 156-244.240.
Partus, Fred P., 4,276,243, Cl. 261-128.000.

Westfall, Norman R., to Sybron Corporation. Fluid resistor. 4,275,767, Cl. 138-40.000.

Westinghouse Electric Corp.: *See*—
Boes, David J., 4,275,891, Cl. 277-96.100.
Cromer, Charles F.; and Yoon, Kue H., 4,276,456, Cl. 200-148.00A.
Kothmann, Richard E.; and Cyphers, Joseph A., 4,276,355, Cl. 429-26.000.
Macko, Joseph E., 4,275,601, Cl. 73-861.040.
Mandelcorn, Lyon; Dakin, Thomas W.; and Miller, Robert L., 4,276,184, Cl. 252-579.000.
Sumka, Elmer H.; and Shea, Henry J., 4,276,500, Cl. 318-369.000.

Weston, Jerome L., to S & S Industries, Inc. Brassiere frame. 4,275,740, Cl. 128-469.000.

Weyerhaeuser Company: *See*—
Quick, Thomas H., 4,276,118, Cl. 162-5.000.

Wheelabrator-Frye, Inc.: *See*—
Van Fossen, Harvey G., 4,275,531, Cl. 51-425.000.

White-BSA Tools Ltd.: *See*—
Tomlinson, Geoffrey E. S., 4,275,625, Cl. 82-25.000.

White, Nicholas F., III: *See*—
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White-Westinghouse Corporation: *See*—
Stewart, Richard F.; and Kennedy, Robert W., 4,276,241, Cl. 261-92.000.

Whitelaw, Stefan P.: *See*—
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Whitmore, Charles H.: *See*—
Woodring, Richard H.; Whitmore, Charles H.; Houtman, Paul K.; and Kowalski, Thomas A., 4,275,997, Cl. 417-218.000.

Wichman, Cynthia A., to Kendall Company, The. Surgical drape with barrier member. 4,275,720, Cl. 128-132.00D.

Wicklund, Rodney D.: *See*—
Orlowski, Gerald J.; Wicklund, Rodney D.; Sandlas, Richard D.; and Weibler, Walter W., 4,276,318, Cl. 426-513.000.

Widnall, Shiela E., to American Can Company. Methods for forming fibrous webs. 4,276,248, Cl. 264-121.000.

Wieder, Wolfgang; Witte, Josef; Moretto, Hans-Heinrich; and Steinberger, Helmut, to Bayer Aktiengesellschaft. Graft polymers containing silicon. 4,276,389, Cl. 525-61.000.

Wild, Karoly: *See*—
Meszaros, Sandor; Kirchner, Gabriella; Balzer, Janos; and Wild, Karoly, 4,276,478, Cl. 250-468.000.

Wilhelm Fette GmbH, Firma: *See*—
von Haas, Rainer, 4,275,507, Cl. 33-199.00B.

Wilhelm, Gary, to Llama Gabilondo y. Cia. S.A. Semiautomatic hand gun. 4,275,640, Cl. 89-147.000.

Willamette Industries, Inc.: *See*—
De Franco, Samuel M., 4,275,828, Cl. 229-23.00R.

Willeitner, Eberhard: *See*—
Laussermair, Friedrich; and Willeitner, Eberhard, 4,276,068, Cl. 55-348.000.

Willett, Daniel E.; Boothroyd, John A.; and Langlais, William F., to Ingersoll-Rand Company. Paddle switch safety button. 4,276,459, Cl. 200-157.000.

Williams, Alan R.: *See*—
Reynolds, James E.; and Williams, Alan R., 4,276,084, Cl. 75-101.00R.

Williams, Frederick C.; and Kummer, Wolfgang H., to Hughes Aircraft Company. Electronically scanned antenna. 4,276,551, Cl. 343-100.0SA.

Williams, Robert J. Fuel line cut-off switch. 4,275,753, Cl. 137-45.000.

Willis, Brian J.; and Dittrick, John W., to Fritzsche Dodge & Olcott, Inc. Novel norbornyl-substituted pyrans, method for their synthesis and use thereof in perfumery. 4,276,220, Cl. 260-345.100.

Willoughby, Arthur F. W.: *See*—
Keen, John M.; and Willoughby, Arthur F. W., 4,276,099, Cl. 148-187.000.

Wilson, Clement B.: *See*—
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Wilson, David M., to Pfizer Inc. Cobalt modified magnetic iron oxide. 4,276,183, Cl. 428-480.000.

Wilson International Incorporated: *See*—
Wilson, Kenneth T., 4,276,441, Cl. 136-206.000.

Wilson, Kenneth T., to Wilson International Incorporated. Thermoelectric generator and method of forming same. 4,276,441, Cl. 136-206.000.

Wilson, Michael, to Racor Industries, Inc. Flame resistant sump assembly. 4,276,162, Cl. 210-94.000.

Wingen, Peter, to Dienes Werke fuer Maschinenteile GmbH & Co. KG. Slitting apparatus. 4,275,631, Cl. 83-501.000.

Winiasz, Michael E., to Clark-Reliance Corporation, The. Steam traps or the like. 4,276,354, Cl. 428-582.000.

Winthrop-Atkins Co., Inc.: *See*—
Blanchard, Roland H., 4,275,517, Cl. 40-158.00R.

Wischer, Hermann, to Dr.-Ing Rudolf Hell GmbH. Boosting video signals. 4,276,568, Cl. 358-282.000.

Wisco Corporation: *See*—
Pohl, Lothar, 4,275,920, Cl. 296-222.000.

Wisconsin Alumni Research Foundation: *See*—
Thornton, Aaron R.; and Obenour, Jerry, 4,275,744, Cl. 128-731.000.

Wisell, Henry L., to Uddeholms Aktiebolag. High speed steel. 4,276,085, Cl. 75-126.00C.

Wisnia, Jeffry A., to Scully Electronic Systems, Inc. Self-heating thermistor probe for low temperature applications. 4,276,536, Cl. 338-23.000.

Witte, Josef: *See*—
Wieder, Wolfgang; Witte, Josef; Moretto, Hans-Heinrich; and Steinberger, Helmut, 4,276,389, Cl. 525-61.000.

Wittke, Ernest C., to Singer Company, The. Phase detector for phase locked loops. 4,276,512, Cl. 328-133.000.

Wolanin, Michael J.: *See*—
Woley, Paul F.; and Wolanin, Michael J., 4,276,032, Cl. 434-274.000.

Wolber, Robert: *See*—
Assmus, Friedrich; Flaig, Hans; Wolber, Robert; and Maurer, Roland, 4,276,634, Cl. 368-300.000.

Woley, Paul F.; and Wolanin, Michael J. Knee joint for anthropomorphic dummy. 4,276,032, Cl. 434-274.000.

Wolfe, Merritt W., to Goodyear Tire & Rubber Company, The. Adjustable tire tread and method of application of a tread. 4,276,103, Cl. 156-96.000.

Wolfe, Randall R. Ear rack for supporting dog ears erect. 4,275,715, Cl. 128-76.00R.

Wolfe, Raymond: *See*—
Nelson, Terence J.; and Wolfe, Raymond, 4,276,614, Cl. 365-36.000.

Wolff, George D.; and Ziemacki, Michael S. Electromechanical precision governor for internal combustion engines. 4,275,691, Cl. 123-352.000.

Wolter, Heinz, to DOM-Sicherheitstechnik GmbH & Co. KG. Electric switching device on a rotary cylinder lock. 4,. 76,453, Cl. 200-44.000.

Wong, Wilson T., to Sperry Rand Corporation. Multiplier circuit which detects and skips over trailing zeros. 4,276,607, Cl. 364-760.000.

Wood, Harry E. Combined hot water heating and stripping column furnace and method. 4,275,708, Cl. 126-355.000.

Wood, Kenneth O.: *See*—
Anderson, Verner; Logan, David J.; and Wood, Kenneth O., 4,275,627, Cl. 83-152.000.

Woodall, Jerry M.: *See*—
Hovel, Harold J.; and Woodall, Jerry M., 4,276,137, Cl. 204-164.000.

Woodard, Randle C. Vacuum head for swimming pool cleaning system. 4,275,474, Cl. 15-1.700.

Woodring, Richard H.; Whitmore, Charles H.; Houtman, Paul K.; and Kowalski, Thomas A., to Parker-Hannifin Corporation. Hydraulic pump with proportional pressure controller. 4,275,997, Cl. 417-218.000.

Worner, Gunter; and Schrape, Peter, to Daimler-Benz Aktiengesellschaft. Detent mechanism for the different positions of a change-speed transmission, especially for motor vehicles. 4,275,613, Cl. 74-475.000.

Wright, Darold L. Portable building and method of transporting it. 4,275,533, Cl. 52-79.100.

Wright, Jack D.; and Snow, Barton H., to General Electric Company. Blocker door actuation system. 4,275,560, Cl. 60-226.00B.

Wright, Phillip D.: *See*—
Nelson, Ronald J.; and Wright, Phillip D., 4,276,098, Cl. 148-171.000.

Wu, Wen-li; and Black, William B., to Monsanto Company. High tenacity polyethylene fibers and process for producing same. 4,276,348, Cl. 428-373.000.

Wu, Yulin; Johnson, Marvin M.; and Nowack, Gerhard P., to Phillips Petroleum Company. Catalyst and process for producing hydroperoxides. 4,276,200, Cl. 252-443.000.

Wu, Yulin, to Phillips Petroleum Company. Preparation of vicinal epoxides. 4,276,223, Cl. 260-348.160.

Xerox Corporation: *See*—
Bell, George E.; Wilson, Clement B.; Thibado, Daniel H.; and Palumbo, Kenneth S., 4,275,956, Cl. 355-3.0DD.
Silverberg, Morton, 4,275,877, Cl. 271-166.000.
Thacker, Charles P.; Norman, Fielding M.; and Rider, Ronald E., 4,276,647, Cl. 371-40.000.
Xomox Corporation: *See*—
Smith, Russell G., 4,275,642, Cl. 91-415.000.
Yako, Hikoya, to West Electric Co., Ltd. Photographic flash device. 4,276,579, Cl. 362-5.000.
Yakshina, Olga K.: *See*—
Zaets, Inna I.; Davydenko, Nikolai M.; Yakshina, Olga K.; Pershina, Nina F.; Demyanenko, Valentina D.; and Pavlov, Jury M., 4,276,088, Cl. 106-1.120.
Yamaga, Eiichi: *See*—
Imamura, Akio; Yamaga, Eiichi; and Nakada, Akira, 4,275,634, Cl. 84-1.030.
Yamaguchi, Fumiaki: *See*—
Yoshitake, Masami; and Yamaguchi, Fumiaki, 4,276,153, Cl. 208-48.00Q.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Kobayashi, Yoshiaki, 4,276,035, Cl. 440-47.000.
Yamaha Matsudoki Kabushiki Kaisha: *See*—
Nishida, Yasuhiro; and Kondo, Yasuo, 4,276,036, Cl. 440-89.000.
Yamamoto, Masataka: *See*—
Hisazumi, Nobuyuki; Yamamoto, Masataka; and Uehara, Tsutomu, 4,275,544, Cl. 53-433.000.
Yamamoto, Megumi, to Bridgestone Tire Co., Ltd. Wear resistant rubber hose. 4,275,770, Cl. 138-133.000.
Yamamura, Masahiro: *See*—
Ienaka, Masanori; Yamamura, Masahiro; Watanabe, Kazuo; and Kominami, Yasuo, 4,276,442, Cl. 179-1.00A.
Yamanaka, Eiji: *See*—
Hayashi, Yoshiro; Sugihara, Akira; Shimura, Takaki; Ishikawa, Kozo; Wada, Kiyoshi; Yamanaka, Eiji; and Senba, Shunsuke, 4,276,572, Cl. 360-12.000.
Yamashita, Mitsuo; and Kondo, Osamu, to Tokyo Shibaura Denki Kabushiki Kaisha. Abnormal feed condition-detecting apparatus for a printing device. 4,275,879, Cl. 271-259.000.
Yamataka, Akihiro: *See*—
Harigaya, Isao; and Yamataka, Akihiro, 4,276,606, Cl. 364-709.000.
Yamazaki, Masami: *See*—
Kitamura, Masatsugu; Onoye, Hideo; and Yamazaki, Masami, 4,276,604, Cl. 364-480.000.
Yang, James H. C., to Firestone Tire & Rubber Company, The. Mold isolator mechanism for centrifugal casting machine. 4,276,012, Cl. 425-435.000.
Yardney Electric Corporation: *See*—
Bilhorn, John M., 4,276,110, Cl. 156-298.000.
Yasuda, Yasushi: *See*—
Enomoto, Hiromu; Yasuda, Yasushi; Ohmichi, Hitoshi; and Mitono, Yoshiharu, 4,276,556, Cl. 357-52.000.
Yasuhara, Yutaka: *See*—
Nishino, Masaki; and Yasuhara, Yutaka, 4,276,228, Cl. 260-453.0AL.
Yelverton, Roy L.: *See*—
Siegman, Edwin J.; and Yelverton, Roy L., 4,276,011, Cl. 425-198 000.
Yokomizo, Hiroshi: *See*—
Manabe, Toshikatsu; Nonogaki, Saburo; Morishita, Hajime; Uchino, Shoichi; Tomita, Yoshifumi; Nishizawa, Masahiro; Yokomizo, Hiroshi; and Ohmatoi, Susumu, 4,276,363, Cl. 430-28.000.
Yokomori, Shinji: *See*—
Tanaka, Akio; Nakajima, Yoshihisa; and Yokomori, Shinji, 4,275,806, Cl. 194-100.00A.
Yomeyama, Tomio: *See*—
Imahori, Seiichi; Hihara, Toshio; Yomeyama, Tomio; and Hirota, Takao, 4,276,047, Cl. 8-532.000.
Yoneda, Yasuhiro; Kitakohji, Toshisuke; and Kitamura, Kenro, to Fujitsu Limited. Positive resist terpolymer composition and method of forming resist pattern. 4,276,365, Cl. 430-270.000.
Yonehara, Hiroshi: *See*—
Ishihara, Eisuke; Yonehara, Hiroshi; Akasaki, Katsuyuki; Minowa, Masao; and Kobayashi, Katsumi, 4,276,286, Cl. 424-117.000.
Yoon, Kue H.: *See*—
Cromer, Charles F.; and Yoon, Kue H., 4,276,456, Cl. 200-148.00A.
Yoshida, Akihiko: *See*—
Nishino, Atsushi; Yoshida, Akihiko; and Ogino, Nobukuni, 4,276,128, Cl. 204-38.00A.
Yoshida, Toshiro; and Kumai, Teruo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Carburetor outer vent control device. 4,275,696, Cl. 123-519.000.
Yoshigai Kikai Kinzoku Kabushiki Kaisha: *See*—
Yoshigai, Toshiharu, 4,275,615, Cl. 74-489.000.
Yoshigai, Toshiharu, to Yoshigai Kikai Kinzoku Kabushiki Kaisha. Device for mounting lever assembly on handle bar. 4,275,615, Cl. 74-489.000.
Yoshikawa, Katsushi; Saito, Masaaki; Ota, Tadaki; and Inoue, Mitsumasa, to Nissan Motor Company, Limited. Carburetor with automatic choking and acceleration device. 4,276,238, Cl. 261-39.00D.
Yoshikawa, Katsushi; Saito, Masaaki; Ota, Tadaki; and Inoue, Mitsumasa, to Nissan Motor Company, Limited. Variable air valve carburetor. 4,276,239, Cl. 261-44.00E.
Yoshimoto, Itaru: *See*—
Mouri, Takenori; Morimoto, Kengi; Yoshimoto, Itaru; Kayama, Hiroyki; Okazawa, Yukio; and Sizukuisi, Touru, 4,275,648, Cl. 99-483.000.
Yoshimura, Tatsushiro; and Tominaga, Shigetake, to Daikin Kogyo Co., Ltd. Fluorine-containing resin composition having improved thermal stability. 4,276,214, Cl. 260-45.75K.
Yoshitake, Masami; and Yamaguchi, Fumiaki, to Mitsui Engineering and Shipbuilding Co., Ltd.; and Mitsui Petrochemical Industries, Ltd. Process for thermal cracking of hydrocarbons and apparatus therefor. 4,276,153, Cl. 208-48.00Q.
Yoshizawa, Tadao; and Sakaguchi, Masayuki, to Kubota Ltd. Flexible plastic pipe joint. 4,275,909, Cl. 285-110.000.
Young, Rodney C.: *See*—
Durant, Graham J.; Ganellin, Charon R.; Owen, Geoffrey R.; and Young, Rodney C., 4,276,301, Cl. 424-273.00R.
Yuen, Shokichi: *See*—
Sugimoto, Kaname; and Yuen, Shokichi, 4,276,282, Cl. 424-85.000.
Yukawa, Hideaki; Osumi, Kazuoki; Nara, Terukazu; and Takayama, Yoshihiro, to Mitsubishi Petrochemical Co., Ltd. Production of L-amino acids. 4,276,380, Cl. 435-115.000.
Zaets, Inna I.; Davydenko, Nikolai M.; Yakshina, Olga K.; Pershina, Nina F.; Demyanenko, Valentina D.; and Pavlov, Jury M. Composition for diffusion coating of ferrous metals. 4,276,088, Cl. 106-1.120.
Zahnradfabrik Friedrichshafen AG: *See*—
Ehrlinger, Friedrich; Mann, Egon; Fischer, Manfred; and Jocham, Rudolf, 4,275,616, Cl. 74-730.000.
Kopp, Hanspeter, 4,275,641, Cl. 91-400.000.
Zambon S.p.A.: *See*—
Della Bella, Davide; and Chiarino, Dario, 4,276,299, Cl. 424-272.000.
Zaner, Clifford: *See*—
Andersen, Harold W.; Andersen, Shirley R.; Zaner, Clifford; and Harrison, Charles H., 4,276,263, Cl. 422-292.000.
Zangenberg, Jan; and Clausen, Peter J. M., to Danfoss A/S. Control device for adjustable fluid pumps or motors. 4,275,996, Cl. 417-221.000.
Zaslavsky, Dan; and Rozenberg, Lev V., to Technion Research and Development Foundation Ltd. Lignosulfonate-based graft polymers their preparation and uses. 4,276,077, Cl. 71-64.0SC.
Zathan, William J. Water level sensor. 4,276,454, Cl. 200-61.050.
Zaunbrecher, Horst: *See*—
Petersen, Harro; Krause, Hans-Joachim; Fischer, Kurt; Segnitz, Adolph; and Zaunbrecher, Horst, 4,276,209, Cl. 260-28.00P.
Zechner, Josef K. S.: *See*—
Beisen Schmidt, Egon; Zechner, Josef K. S.; and Frang, Gosta M., 4,276,052, Cl. 23-301.000.
Zehner, Lee R.: *See*—
Vartuli, James C.; and Zehner, Lee R., 4,276,197, Cl. 252-435.000.
Zeligman, Robert; and Zengerle, John R., to Frontier Footwear Corporation. Sandal structure. 4,275,512, Cl. 36-11.500.
Zeller, Norbert: *See*—
Lindner, Tassilo; Zeller, Norbert; Frey, Volker; Riedle, Rudolf; John, Peter; and Engelsberger, Georg, 4,276,426, Cl. 556-479.000.
Zeltzer, Hyman: *See*—
Boudrot, Robert J.; Shambaugh, John S.; and Zeltzer, Hyman, 4,276,361, Cl. 429-186.000.
Zengerle, John R.: *See*—
Zeligman, Robert; and Zengerle, John R., 4,275,512, Cl. 36-11.500.
Zielsdorf, Franklin J., to Peerless Machinery Corporation. Refrigerated dough mixer. 4,275,568, Cl. 62-342.000.
Ziemacki, Michael S.: *See*—
Wolff, George D.; and Ziemacki, Michael S., 4,275,691, Cl. 123-352.000.
Ziman, Stephen D., to Chevron Research Company. Herbicidal and plant-growth-regulating 1,2,4-trisubstituted-1,2,4-triazolidin-3-one-5-thione. 4,276,420, Cl. 548-264.000.
Zimmer USA, Inc.: *See*—
Bolesky, Richard C., 4,275,717, Cl. 128-92.0BC.
Zimmerman, Morris: *See*—
Jones, Howard; Clark, Robert L.; and Zimmerman, Morris, 4,276,298, Cl. 424-270.000.
Zodrow, Rudolf: *See*—
Mohn, Hans-Werner; Buchholz, Rainer; Hoveler, Egon; and Zodrow, Rudolf, 4,275,807, Cl. 198-344.000.
Zoecon Corporation: *See*—
Anderson, Richard J., 4,276,230, Cl. 260-465.00D.
Zverkov, Garik E.: *See*—
Anoshko, Vladimir A.; Godin, Eduard M.; Gavrilov, Anatoly N.; Zverkov, Garik E.; Matskevich, Vladimir I.; Chepurin, Valentin M.; Semenov, Valentin P.; Grachev, Vladimir V.; and Butylin, Mikhail Y., 4,275,579, Cl. 72-59.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF JUNE, 1981

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ando, Kozo: *See*—
Otake, Nobuyuki; Ando, Kozo; Hori, Hironobu; and Sato, Ykinori, Re. 30,659, Cl. 401-209.000.

Arvidsson, Karl E. Apparatus for treating work pieces. Re. 30,658, Cl. 118-50.000.

Davitian, Edward. Weaving system, method of weaving and apparatus. Re. 30,656, Cl. 28-151.000.

Eisenberg, Morris, to Electrochimica Corporation. Electric current producing galvanic cell. Re. 30,661, Cl. 429-194.000.

Electrochimica Corporation: *See*—
Eisenberg, Morris, Re. 30,661, Cl. 429-194.000.

Foley, James P., to Roanwell Corporation. Communications headset with reversible mounting means. Re. 30,662, Cl. 179-156.00A.

Hori, Hironobu: *See*—
Otake, Nobuyuki; Ando, Kozo; Hori, Hironobu; and Sato, Ykinori, Re. 30,659, Cl. 401-209.000.

Laganis, Deno. Water soluble insulating varnish. Re. 30,660, Cl. 260-21.000.

Mason, Stanley I., Jr.; and Richardson, James E., to Simco, Incorporated. Balanced botanical growth container. Re. 30,657, Cl. 47-79.000.

Otake, Nobuyuki; Ando, Kozo; Hori, Hironobu; and Sato, Ykinori, to Tokyo Boshi Kabushiki Kaisha. Pen points for writing instruments. Re. 30,659, Cl. 401-209.000.

Richardson, James E.: *See*—
Mason, Stanley I., Jr.; and Richardson, James E., Re. 30,657, Cl. 47-79.000.

Roanwell Corporation: *See*—
Foley, James P., Re. 30,662, Cl. 179-156.00A.

Sato, Ykinori: *See*—
Otake, Nobuyuki; Ando, Kozo; Hori, Hironobu; and Sato, Ykinori, Re. 30,659, Cl. 401-209.000.

Schnitzius, Klaus, to Stabilus GmbH. Electrically conductive pneumatic spring with door actuated switch means. Re. 30,663, Cl. 200-52.00R.

Simco, Incorporated: *See*—
Mason, Stanley I., Jr.; and Richardson, James E., Re. 30,657, Cl. 47-79.000.

Stabilus GmbH: *See*—
Schnitzius, Klaus, Re. 30,663, Cl. 200-52.00R.

Tokyo Boshi Kabushiki Kaisha: *See*—
Otake, Nobuyuki; Ando, Kozo; Hori, Hironobu; and Sato, Ykinori, Re. 30,659, Cl. 401-209.000.

LIST OF DESIGN PATENTEES

Ackeret, Peter, to IDN Inventions and Development Novelties AG. Container for tape cassettes. 259,676, 6-30-81, Cl. D3-35.000.

Adidas Fabrique de Chaussures de Sport: *See*—
Joseph, Michel, 259,671, Cl. D2-40.000.
Joseph, Michel, 259,672, Cl. D2-40.000.

Alco Foodservice Equipment Company: *See*—
Wasserstrom, Henry; and Klein, Edward, 259,725, Cl. D15-116.000.

Ambasz, Emilio, to Center for Design Research and Development N.V. Chair shell. 259,688, 6-30-81, Cl. D6-197.000.

American Brush Company, Inc.: *See*—
Furst, Garry, 259,683, Cl. D6-130.000.

Arad, Avi; and Bretschger, Edward B., to Empire of Carolina, Inc. Toy bus. 259,730, 6-30-81, Cl. D21-78.000.

Averitt, Marnie C.: *See*—
Tisserat, Craig R.; Mendoza, Enric C.; Averitt, Marnie C.; and Olivari, Humbert, 259,733, Cl. D23-18.000.

Bagwell, Connice W. Top for a drink cup. 259,705, 6-30-81, Cl. D9-454.000.

Bellini, Mario, to Ing. C. Olivetti & C., S.p.A. Portable typewriting machine. 259,726, 6-30-81, Cl. D18-1.000.

Benjamin Products B.V.: *See*—
Bouwman, Cornelis G., 259,681, Cl. D6-85.000.

Benner-Nawman, Inc.: *See*—
Byberg, Bjarne I.; and Kientz, Robert B., 259,695, Cl. D8-58.000.

Bennington Company, The: *See*—
Handel, David M., 259,689, Cl. D6-200.000.

Benst Holdings Ltd.: *See*—
Stein, Ben, 259,710, Cl. D11-152.000.

Berkline Corporation, The: *See*—
Long, Stapleton, 259,678, Cl. D6-37.000.

Boschetti, Armando, to Paul B. Elder Company. Ultraviolet lamp housing. 259,738, 6-30-81, Cl. D24-68.000.

Bouwman, Cornelis G., to Benjamin Products B.V. Display rack. 259,681, 6-30-81, Cl. D6-85.000.

Bretschger, Edward B.: *See*—
Arad, Avi; and Bretschger, Edward B., 259,730, Cl. D21-78.000.

Brizzolara, Louis E., Jr., to CBS Inc. Utility knife handle. 259,697, 6-30-81, Cl. D8-107.000.

Brown, Jennifer A., to LaBonte, Claudette A. Golfer's pin. 259,709, 6-30-81, Cl. D11-61.000.

Buchsteiner nee Fetzer, Renate, to Johannes Buchsteiner GmbH & Co. KG. Dish with hinged cover. 259,690, 6-30-81, Cl. D7-16.000.

Burlington Furniture Div. of Burlington Industries, Inc.: *See*—
West, Haywood L., 259,686, Cl. D6-164.000.

Byberg, Bjarne I.; and Kientz, Robert B., to Benner-Nawman, Inc. Cable cutter. 259,695, 6-30-81, Cl. D8-58.000.

Cardinal American Corporation: *See*—
Sroub, Joseph W., 259,679, Cl. D6-38.000.

Castronovo, Robert, to Trident Products, Inc. Cap for a disinfectant dispenser. 259,704, 6-30-81, Cl. D9-447.000.

CBS Inc.: *See*—
Brizzolara, Louis E., Jr., 259,697, Cl. D8-107.000.

Center for Design Research and Development N.V.: *See*—
Ambasz, Emilio, 259,688, Cl. D6-197.000.

Cerrato, Vincent, to Vending Components, Inc. Gas pressure regulator. 259,734, 6-30-81, Cl. D23-21.000.

Chasen, Lee R., to Coats & Clark, Inc. Hook. 259,700, 6-30-81, Cl. D8-367.000.

Coats & Clark, Inc.: *See*—
Chasen, Lee R., 259,700, Cl. D8-367.000.

Coca-Cola Company, The: *See*—
Davis, Charles L., 259,684, Cl. D6-148.000.

Conair Corporation: *See*—
Iammatteo, Pasquale, 259,742, Cl. D28-18.000.

Corning Glass Works: *See*—
Hora, Richard, 259,691, Cl. D7-39.000.

Dart Industries Inc.: *See*—
Quinn, Leonard L., 259,692, Cl. D7-65.000.

Davis, Charles L., to Coca-Cola Company, The. Display rack. 259,684, 6-30-81, Cl. D6-148.000.

de Leon, Bernice L. Taco shell. 259,670, 6-30-81, Cl. D1-2.000.

Digital Data, Inc.: *See*—
Fuller, Stanley E.; and Roeck, Erich F., 259,722, Cl. D14-68.000.

Electrofilm, Inc.: *See*—
Pusl, Kenneth, 259,721, Cl. D13-32.000.

Electrolux Corporation: *See*—
Ferraris, John T., 259,724, Cl. D15-55.000.

Empire of Carolina, Inc.: *See*—
Arad, Avi; and Bretschger, Edward B., 259,730, Cl. D21-78.000.

Feeley, Frederick P. Vehicle auxiliary compartment. 259,714, 6-30-81, Cl. D12-156.000.

Ferraris, John T., to Electrolux Corporation. Vacuum cleaner. 259,724, 6-30-81, Cl. D15-55.000.

Fisher, Carlman: *See*—
Gordon, Andrew W.; and Fisher, Carlman, 259,675, Cl. D2-318.000.

Fuller, Stanley E.; and Roeck, Erich F., to Digital Data, Inc. Broadcasting system portable receiving terminal housing. 259,722, 6-30-81, Cl. D14-68.000.

Furst, Garry, to American Brush Company, Inc. Paint roller display rack. 259,683, 6-30-81, Cl. D6-130.000.

Gillette Company, The: *See*—
Zierhut, Clarence, 259,727, Cl. D19-51.000.

Gordon, Andrew W.; and Fisher, Carlman, to Northern Shoe Bindings Co., Inc. Foot stabilizer innersole. 259,675, 6-30-81, Cl. D2-318.000.

Halacy, Daniel S., Jr. Solar oven. 259,694, 6-30-81, Cl. D7-110.000.

Handel, David M., to Bennington Company, The. Counterbalanced upholstered headrest. 259,689, 6-30-81, Cl. D6-200.000.

Heydenreich, William T. Drip receptacle for a hanging plant container. 259,712, 6-30-81, Cl. D11-164.000.

Hollinger, Eleanor. Razor. 259,743, 6-30-81, Cl. D28-46.000.

Hora, Richard, to Corning Glass Works. Decal for culinary ware or the like. 259,691, 6-30-81, Cl. D7-39.000.
Hughes, John D. Tie-down device. 259,699, 6-30-81, Cl. D8-367.000.
Iammatteo, Pasquale, to Conair Corporation. Air diffuser for a hair dryer. 259,742, 6-30-81, Cl. D28-18.000.
IDN Inventions and Development of Novelties AG: *See*—
Ackeret, Peter, 259,676, Cl. D3-35.000.
Ing. C. Olivetti & C., S.p.A.: *See*—
Bellini, Mario, 259,726, Cl. D18-1.000.
Jack Daniel Distillery, Lem Motlow, Prop., Inc.: *See*—
Redmond, Jobie G., 259,680, Cl. D6-70.000.
Johannes Buchsteiner GmbH & Co. KG: *See*—
Buchsteiner nee Fetzer, Renate, 259,690, Cl. D7-16.000.
Johnson, Lawrence E., to South Pacific Industries. Pool skimmer. 259,739, 6-30-81, Cl. D25-2.000.
Johnson, Perry B. Airplane. 259,713, 6-30-81, Cl. D12-326.000.
Joseph, Michel, to Adidas Fabrique de Chaussures de Sport. Bathing suit. 259,671, 6-30-81, Cl. D2-40.000.
Joseph, Michel, to Adidas Fabrique de Chaussures de Sport. Bathing suit. 259,672, 6-30-81, Cl. D2-40.000.
Kientz, Robert B.: *See*—
Byberg, Bjarne I.; and Kientz, Robert B., 259,695, Cl. D8-58.000.
Kitai, Isao; and Yamasaki, Tsutomu, to Sharp Corporation. Low frequency power supply for medical treatment apparatus. 259,737, 6-30-81, Cl. D24-8.000.
Klein, Edward: *See*—
Wasserstrom, Henry; and Klein, Edward, 259,725, Cl. D15-116.000.
LaBonte, Claudette A.: *See*—
Brown, Jennifer A., 259,709, Cl. D11-61.000.
Laws, Ibrahim D. Game board. 259,728, 6-30-81, Cl. D21-25.000.
Levin, Gary M. Railroad restaurant. 259,740, 6-30-81, Cl. D25-11.000.
Levin, Monte, to Manow International Corp. Shoe. 259,674, 6-30-81, Cl. D2-309.000.
Llorente, Jacques. Bottle. 259,703, 6-30-81, Cl. D9-384.000.
Long, Stapleton, to Berkline Corporation, The. Seat. 259,678, 6-30-81, Cl. D6-37.000.
MacLean, Charles A. Horseman figure. 259,711, 6-30-81, Cl. D11-159.000.
MacNeill, Arden B. Handle for a golf spike wrench, screw driver, corkscrew and other devices. 259,698, 6-30-81, Cl. D8-107.000.
Manow International Corp.: *See*—
Levin, Monte, 259,674, Cl. D2-309.000.
Matsui, Hidetoshi. Kinetic sculpture. 259,729, 6-30-81, Cl. D21-62.000.
Melilli, Dennis A. Van door luggage rack. 259,715, 6-30-81, Cl. D12-157.000.
Mendoza, Enric C.: *See*—
Tisserat, Craig R.; Mendoza, Enric C.; Averitt, Marnie C.; and Olivari, Humbert, 259,733, Cl. D23-18.000.
Mitutoyo Manufacturing Company, Ltd.: *See*—
Nishina, Shingo, 259,707, Cl. D10-73.000.
Moreland, Gerald W. Hydro-therapy fitting design. 259,735, 6-30-81, Cl. D23-34.000.
Nishina, Shingo, to Mitutoyo Manufacturing Company, Ltd. Height gauge. 259,707. 6-30-81, Cl. D10-73.000.
Norris, Curtis. Wheel. 259,718, 6-30-81, Cl. D12-205.000.
Northern Shoe Bindings Co., Inc.: *See*—
Gordon, Andrew W.; and Fisher, Carlman, 259,675, Cl. D2-318.000.
Olivari, Humbert: *See*—
Tisserat, Craig R.; Mendoza, Enric C.; Averitt, Marnie C.; and Olivari, Humbert, 259,733, Cl. D23-18.000.
Ottmar, Albert D. Pole charcoal grill. 259,693, 6-30-81, Cl. D7-109.000.
Parker-Hannifin Corp.: *See*—
Shea, Janet D., 259,696, Cl. D8-86.000.
Paul B. Elder Company: *See*—
Boschetti, Armando, 259,738, Cl. D24-68.000.
Peirce, Elwin E.; and Waltz, Arthur L. Ventilator section. 259,736, 6-30-81, Cl. D23-163.000.
Piesinger, Gregory H. Clip lead electrode for use in attaching electronic apparatus to an animal's skin. 259,720, 6-30-81, Cl. D13-24.000.
Pusl, Kenneth, to Electrofilm, Inc. Control module. 259,721, 6-30-81, Cl. D13-32.000.
Quinn, Leonard L., to Dart Industries Inc. Kettle. 259,692, 6-30-81, Cl. D7-65.000.
Rain Bird Sprinkler Consumer Mfg. Corp.: *See*—
Tisserat, Craig R.; Mendoza, Enric C.; Averitt, Marnie C.; and Olivari, Humbert, 259,733, Cl. D23-18.000.
Redmond, Jobie G., to Jack Daniel Distillery, Lem Motlow, Prop., Inc. Side cushion chair. 259,680, 6-30-81, Cl. D6-70.000.
Reppert, Merlyn R. Wheel center. 259,719, 6-30-81, Cl. D12-209.000.
Revlon, Inc.: *See*—
Scalice, John J., 259,685, Cl. D6-157.000.
Scalice, John J., 259,687, Cl. D6-186.000.
Richmond, Edwin. Bottle or similar article. 259,702, 6-30-81, Cl. D9-314.000.
Robert, Tony. Wall mountable coin bank. 259,744, 6-30-81, Cl. D99-35.000.
Roeck, Erich F.: *See*—
Fuller, Stanley E.; and Roeck, Erich F., 259,722, Cl. D14-68.000.
Rosenow, Monroe H. Carrying bag for golf shoes. 259,677, 6-30-81, Cl. D3-37.000.
Rowenta-Werke, GmbH: *See*—
Stuetzer, Franz A., 259,741, Cl. D27-36.000.
Rubbermaid Specialty Products Inc.: *See*—
Wooters, Dwight N., 259,717, Cl. D12-203.000.
Ruszczynski, Sue M. Wallpapering apron. 259,673, 6-30-81, Cl. D2-220.000.
Scalice, John J., to Revlon, Inc. Display unit. 259,685, 6-30-81, Cl. D6-157.000.
Scalice, John J., to Revlon, Inc. Combined cosmetic display and storage unit. 259,687, 6-30-81, Cl. D6-186.000.
Sharp Corporation: *See*—
Kitai, Isao; and Yamasaki, Tsutomu, 259,737, Cl. D24-8.000.
Shea, Janet D., to Parker-Hannifin Corp. Teiescopic magnetic screw starter. 259,696, 6-30-81, Cl. D8-86.000.
Smith, Floyd A. Carpenters' lay-off tape. 259,706, 6-30-81, Cl. D10-71.000.
Solartron Electronic Group Limited: *See*—
Swinstead, Nicholas D., 259,708, Cl. D10-80.000.
South Pacific Industries: *See*—
Johnson, Lawrence E., 259,739, Cl. D25-2.000.
Sroub, Joseph W., to Cardinal American Corporation. Chaise lounge. 259,679, 6-30-81, Cl. D6-38.000.
Standing, Guy L. Container for spare toilet tissue roll. 259,682, 6-30-81, Cl. D6-97.000.
Stein, Ben, to Benst Holdings Ltd. Combined flower pot and saucer. 259,710, 6-30-81, Cl. D11-152.000.
Stuetzer, Franz A., to Rowenta-Werke, GmbH. Lighter. 259,741, 6-30-81, Cl. D27-36.000.
Swinstead, Nicholas D., to Solartron Electronic Group Limited. Electronic instrument housing or similar article. 259,708, 6-30-81, Cl. D10-80.000.
Sztuden, Luis. Bottle. 259,701, 6-30-81, Cl. D9-310.000.
Tisserat, Craig R.; Mendoza, Enric C.; Averitt, Marnie C.; and Olivari, Humbert, to Rain Bird Sprinkler Consumer Mfg. Corp. Hose nozzle. 259,733, 6-30-81, Cl. D23-18.000.
Trident Products, Inc.: *See*—
Castronovo, Robert, 259,704, Cl. D9-447.000.
U.S. Philips Corporation: *See*—
van de Ven, Peter H. J., 259,723, Cl. D14-73.000.
van de Ven, Peter H. J., to U.S. Philips Corporation. Clock radio receiver. 259,723, 6-30-81, Cl. D14-73.000.
Van Koert, John O. Jig saw puzzle or the like. 259,731, 6-30-81, Cl. D21-104.000.
Vella, Tony J. Offset hosel for a golf club. 259,732, 6-30-81, Cl. D21-221.000.
Vending Components, Inc.: *See*—
Cerrato, Vincent, 259,734, Cl. D23-21.000.
Waltz, Arthur L.: *See*—
Peirce, Elwin E.; and Waltz, Arthur L., 259,736, Cl. D23-163.000.
Wasserstrom, Henry; and Klein, Edward, to Alco Foodservice Equipment Company. Beverage dispensing tower. 259,725, 6-30-81, Cl. D15-116.000.
Watanabe, Toshio. Back-up rear view mirror for trucks and like vehicles. 259,716, 6-30-81, Cl. D12-187.000.
West, Haywood L., to Burlington Furniture Div. of Burlington Industries, Inc. Dresser or the like. 259,686, 6-30-81, Cl. D6-164.000.
Wooters, Dwight N., to Rubbermaid Specialty Products Inc. Rear auto mat. 259,717, 6-30-81, Cl. D12-203.000.
Yamasaki, Tsutomu: *See*—
Kitai, Isao; and Yamasaki, Tsutomu, 259,737, Cl. D24-8.000.
Zierhut, Clarence, to Gillette Company, The. Writing instrument. 259,727, 6-30-81, Cl. D19-51.000.

LIST OF PLANT PATENTEES

Elliot, Charles P. Rose plant. 4,747, 6-30-81, Cl. 18.000.
Enright, Paul C. Gazania plant. 4,750, 6-30-81, Cl. 68.000.
Hartman, Marsha W., heir: *See*—
Wassiliew, Fedor, deceased; Wassiliew, Nicolaus, heir; Wassiliew, Alexander, heir; Hartman, Marsha W., heir; and Wassiliew, Valentina, heir, 4,748, Cl. 42.000.
Jackson & Perkins Co.: *See*—
Wassiliew, Fedor, deceased; Wassiliew, Nicolaus, heir; Wassiliew, Alexander, heir; Hartman, Marsha W., heir; and Wassiliew, Valentina, heir, 4,748, Cl. 42.000.
Kerrigan, Howard. Azalea plant. 4,749, 6-30-81, Cl. 57.000.

Wassiliew, Alexander, heir: *See*—
Wassiliew, Fedor, deceased; Wassiliew, Nicolaus, heir; Wassiliew, Alexander, heir; Hartman, Marsha W., heir; and Wassiliew, Valentina, heir, 4,748, Cl. 42.000.

Wassiliew, Fedor, deceased; by Wassiliew, Nicolaus, heir; by Wassiliew, Alexander, heir; by Hartman, Marsha W., heir; and by Wassiliew, Valentina, heir, to Jackson & Perkins Co. Dwarf peach W-110. 4,748, 6-30-81, Cl. 42.000.

Wassiliew, Nicolaus, heir: *See*—
Wassiliew, Fedor, deceased; Wassiliew, Nicolaus, heir; Wassiliew, Alexander, heir; Hartman, Marsha W., heir; and Wassiliew, Valentina, heir, 4,748, Cl. 42.000.

Wassiliew, Valentina, heir: *See*—
Wassiliew, Fedor, deceased; Wassiliew, Nicolaus, heir; Wassiliew, Alexander, heir; Hartman, Marsha W., heir; and Wassiliew, Valentina, heir, 4,748, Cl. 42.000.

CLASSIFICATION OF PATENTS

ISSUED JUNE 30, 1981

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

82 4,275,467
115 4,275,468

CLASS 3

1.5 4,275,469

CLASS 4

316 4,275,470
387 4,275,471

CLASS 5

60 4,275,472

CLASS 8

115.5 4,276,044
471 4,276,045
532 4,276,046
4,276,047

CLASS 9

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CLASS 15

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104.06 R 4,275,475
236 R 4,275,476
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CLASS 19

150 4,275,482
240 4,275,483

CLASS 23

230 B 4,276,049
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230 R 4,276,048
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301 4,276,052

CLASS 24

20 R 4,275,484
30.5 R 4,275,485
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263 DC 4,275,487
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279 4,275,489

CLASS 27

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CLASS 28

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426.5 4,275,492
454 4,275,493
592 R 4,275,494
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CLASS 30

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43.6 4,275,496
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180 4,275,499
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CLASS 33

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172 E 4,275,505
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199 B 4,275,507

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57 R 4,275,509
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92 4,275,511

CLASS 36

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CLASS 37

42 R 4,275,514

CLASS 38

102.91 4,275,515

CLASS 40

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605 4,275,520

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CLASS 43

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112 4,275,523

CLASS 44

51 4,276,053
4,276,054
53 4,276,055

CLASS 46

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CLASS 47

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501 4,275,526

CLASS 51

103 TF 4,275,527
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CLASS 52

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79.1 4,275,533
82 4,275,534
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220 4,275,536
223 R 4,275,537
299 4,275,538
309.11 4,275,539
314 4,275,540
483 4,275,541
731 4,275,542

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374 4,275,543
433 4,275,544

CLASS 55

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40 4,276,057
48 4,276,058
52 4,276,059
67 4,276,060
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77 4,276,062
84 4,276,063
217 4,276,064
278 4,276,065
287 4,276,066
337 4,276,067
348 4,276,068
379 4,276,069
429 4,276,070
523 4,276,071

CLASS 56

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10.2 4,275,546
13.6 4,275,547
328 R 4,275,549
328 TS 4,275,548
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370 4,275,551
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CLASS 59

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CLASS 60

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226 B 4,275,560
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673 4,275,563
738 4,275,564

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342 4,275,568
373 4,275,569
468 4,275,570

CLASS 64

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CLASS 65

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77 4,276,073
106 4,276,074
160 4,276,075
241 4,276,076

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CLASS 70

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CLASS 71

64 SC 4,276,077
88 4,276,078
100 4,276,079
108 4,276,080

CLASS 72

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59 4,275,579
239 4,275,580
385 4,275,581
391 4,275,582
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410 4,275,584

CLASS 73

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35 4,275,586
64.4 4,275,587
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425.4 P 4,275,591
432 R 4,275,592
454 4,275,593
487 4,275,594
606 4,275,595
607 4,275,596
618 4,275,597
622 4,275,598
774 4,275,599
843 4,275,600
861.04 4,275,601
861.22 4,275,602
861.68 4,275,603
862.32 4,275,588

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10.39 4,275,606
15.63 4,275,607
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200 4,275,610
471 XY 4,275,611
473 R 4,275,612
475 4,275,613
476 4,275,614
489 4,275,615
730 4,275,616
750 R 4,275,617
878 4,275,618

CLASS 75

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10 R 4,276,082
82 4,276,083
101 R 4,276,084
126 C 4,276,085
134 C 4,276,086
243 4,276,087

CLASS 81

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57.39 4,275,620
111 4,275,621
125.1 4,275,622
126 4,275,623

CLASS 82

1.2 4,275,624
25 4,275,625
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CLASS 83

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302 4,275,629
500 4,275,630
501 4,275,631
794 4,275,632
886 4,275,633

CLASS 84

1.03 4,275,634
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383 R 4,275,636

CLASS 87

48 4,275,638

CLASS 89

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CLASS 91

400 4,275,641
415 4,275,642
444 4,275,643

CLASS 98

36 4,275,645

CLASS 99

323 4,275,646
339 4,275,647
483 4,275,648

CLASS 100

4 4,275,649
45 4,275,650
229 A 4,275,651

CLASS 101

4 4,275,652
93.14 4,275,653
110 4,275,654
123 4,275,655
211 4,275,656

CLASS 102

210 4,275,658
531 4,275,657

CLASS 104

2 4,275,659
247 4,275,660

CLASS 105

199 C 4,275,661
377 4,275,662
413 4,275,663
430 4,275,664

CLASS 106

1.12 4,276,088
14.12 4,276,089
18.32 4,276,090
58 4,276,091
100 4,276,092
281 R 4,276,093

CLASS 108

14 4,275,665
101 4,275,666

CLASS 109

44 4,275,667

CLASS 110

245 4,275,668

CLASS 111

3 4,275,669
85 4,275,670
4,275,671
99 4,275,672

CLASS 112

105 4,275,673
158 E 4,275,674
229 4,275,675

CLASS 114

144 E 4,275,676
246 4,275,677
248 4,275,678
264 4,275,679
295 4,275,680

CLASS 116

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CLASS 118

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303 4,275,682
407 4,275,683

CLASS 119

1 4,275,684
20 4,275,685
29 4,275,686

CLASS 122

20 B 4,275,687

CLASS 123

41.12 4,275,688
53 B 4,275,689
146.5 A 4,275,690
352 4,275,691
419 4,275,692
447 4,275,693
463 4,275,694
486 4,275,695
519 4,275,696
520 4,275,697
527 4,275,698
557 4,275,699
590 4,275,700
609 4,275,701
610 4,275,702
617 4,275,703

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110 R 4,275,705
163 R 4,275,706
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92 BC 4,275,717
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132 D 4,275,719
4,275,720
133 4,275,721
200.24 4,275,722
202.22 4,275,723
207.14 4,275,724
4,275,725
213 A 4,275,726
214 E 4,275,727
215 4,275,728
218 C 4,275,729
234 4,275,730
276 4,275,731
4,275,732
303 R 4,275,733
303.1 4,275,734
305 4,275,735
335 4,275,736
419 PG 4,275,737
4,275,738
419 PS 4,275,739
469 4,275,740
653 4,275,741
703 4,275,742
731 4,275,743
4,275,744

CLASS 131

180 4,275,746
195 4,275,747
270 4,275,745

CLASS 132

7 4,275,748
11 A 4,275,749
84 B 4,275,750

CLASS 133

3 C 4,275,751

CLASS 134

10 4,276,094

CLASS 136

206 4,276,440
4,276,441

CLASS 137

7 4,275,752
45 4,275,753
75 4,275,754
195 4,275,755
234.5 4,275,756
363 4,275,757
489 4,275,758
528 4,275,759
546 4,275,760
595 4,275,761
601 4,275,762
613 4,275,763
614.19 4,275,764
625.48 4,275,765

CLASS 138

37 4,275,766
40 4,275,767
104 4,275,768
109 4,275,769
133 4,275,770
149 4,275,771

CLASS 139

91 4,275,772
429 4,275,773

CLASS 141

1 4,275,774
83 4,275,775
392 4,275,776

CLASS 144

138 4,275,777
193 A 4,275,778
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CLASS 148

1.5 4,276,095
16.6 4,276,096
101 4,276,097
171 4,276,098
187 4,276,099

CLASS 149

109.6 4,276,100

CLASS 150

52 R 4,275,780

CLASS 152

224 4,275,781
314 4,275,782

CLASS 156

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85 4,276,102
96 4,276,103
123 R 4,276,104
128 N 4,276,105
181 4,276,106
238 4,276,107
244.24 4,276,108
273 4,276,109
298 4,276,110
308.2 4,276,111
360 4,276,112

502 4,276,113
645 4,276,114

CLASS 159

1 RW 4,276,115
47 R 4,276,116
4,276,117

CLASS 162

5 4,276,118
49 4,276,119

CLASS 164

146 4,275,783

CLASS 165

134 R 4,275,784
183 4,275,785

CLASS 166

65 R 4,275,786
251 4,275,787
292 4,275,788
294 4,275,789
314 4,275,790

CLASS 172

570 4,275,791
703 4,275,792

CLASS 173

9 4,275,793
135 4,275,794

CLASS 175

26 4,275,795
385 4,275,796

CLASS 179

1 A 4,276,442
1 E 4,276,446
1 F 4,276,443
1 SC 4,276,445
1 SM 4,276,444
18 FG 4,276,447
84 T 4,276,448
115.5 PV 4,276,449
156 A Re.30,662
170 D 4,276,450
175.2 C 4,276,451
180 4,276,452

CLASS 180

2 R 4,275,797
143 4,275,798
255 4,275,799
317 4,275,800

CLASS 181

290 4,275,801

CLASS 188

134 4,275,802
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CLASS 192

3.58 4,275,804
46 4,275,805

CLASS 194

100 A 4,275,806

CLASS 198

344 4,275,807
533 4,275,808
624 4,275,809

CLASS 200

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52 R Re.30,663
61.05 4,276,454
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148 A 4,276,456
153 G 4,276,457
153 J 4,276,458
157 4,276,459
292 4,276,460
329 4,276,461

CLASS 202

100 4,276,120
227 4,276,121
234 4,276,122
236 4,276,124
241 4,276,123

CLASS 203

4 4,276,125
69 4,276,126

CLASS 204

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38 A 4,276,128
58 4,276,129
98 4,276,130
129 4,276,131
129.1 4,276,132
145 R 4,276,133
153 4,276,134
159.13 4,276,135
159.22 4,276,136
164 4,276,137
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180 P 4,276,140
180 R 4,276,139
195 M 4,276,141
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195 P 4,276,144
195 S 4,276,142
247 4,276,145
266 4,276,146
272 4,276,147
281 4,276,148

CLASS 206

45.34 4,275,810
204 4,275,811
278 4,275,812
339 4,275,813
455 4,275,814
508 4,275,815

CLASS 208

48 Q 4,276,153
120 4,276,149
4,276,150
138 4,276,151
139 4,276,152

CLASS 209

3 4,276,154
10 4,276,155
166 4,276,156
246 4,276,157
255 4,276,158
273 4,276,159

CLASS 210

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94 4,276,162
136 4,276,163
170 4,276,164
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404 4,276,169
436 4,276,170
437 4,276,171
490 4,276,172
500.2 4,276,173
613 4,276,174
636 4,276,175
637 4,276,176
638 4,276,177
660 4,276,160
662 4,276,178
679 4,276,179
683 4,276,180
741 4,276,181

CLASS 211

68 4,275,816

CLASS 215

217 4,275,817

CLASS 219

10.55 F 4,276,462
121 LB 4,276,463
136 4,276,464
388 4,276,465
523 4,276,466

CLASS 220

90 4,275,818

CLASS 221

186 4,275,819

CLASS 222

3 4,275,820
61 4,275,821
63 4,275,822
94 4,275,823
168 4,275,824
590 4,275,825

CLASS 223

96 4,275,826

CLASS 225

77 4,275,827

CLASS 229

23 R 4,275,828

CLASS 232

17 4,275,829
43.1 4,275,830

CLASS 235

92 CT 4,276,468
92 PK 4,276,467
458 4,276,469
463 4,276,470

CLASS 237

2 R 4,275,831

CLASS 238

310 4,275,832

CLASS 239

2 S 4,275,833
3 4,275,834
60 4,275,835
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272 4,275,839
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446 4,275,842
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533.12 4,275,845
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46.06 4,275,849
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CLASS 242

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71.2 4,275,855
75.44 4,275,856

CLASS 244

53 B 4,275,857
121 4,275,858
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CLASS 248

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CLASS 249

79 4,275,864

CLASS 250

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327.1 4,276,473
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373 4,276,475
385 4,276,476
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468 4,276,478
492 R 4,276,479
560 4,276,480

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63 4,275,865
250 4,275,866
297 4,275,867
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CLASS 260

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326.5 FN 4,276,215
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346.75 4,276,222
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01 : 4,275,715	4,276,078	4,276,636	4,276,545	4,276,393	4,275,739
02 : 4,275,501	4,276,091	4,276,647	4,276,569	4,276,413	4,275,826
04 : 4,275,472	4,276,097	4,276,654	4,276,573	4,276,464	4,275,893
4,275,512	4,276,112	08 : 4,275,506	4,276,576	4,276,470	4,275,961
4,275,713	4,276,132	4,275,633	4,276,655	4,276,484	4,276,256
4,276,318	4,276,141	4,275,884	13 : 4,275,716	4,276,540	4,276,268
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4,276,596	4,276,163	4,275,960	4,275,940	18 : 4,275,531	4,275,526
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06 : Re.30,661	4,276,206	4,276,081	4,276,008	4,275,717	4,275,656
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4,275,533	4,276,329	4,275,640	4,275,485	4,276,006	4,275,833
4,275,599	4,276,330	4,275,729	4,275,508	4,276,100	4,275,859
4,275,605	4,276,344	4,275,784	4,275,535	4,276,233	4,275,957
4,275,609	4,276,395	4,275,813	4,275,541	4,276,300	4,275,978
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4,275,672	4,276,466	4,276,253	4,275,748	4,275,550	4,276,177
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4,275,724	4,276,486	4,276,356	4,275,825	4,276,015	4,276,248
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4,749

4,750

06 : 4,747

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